

FOUND COMPOSITION:
ECOLOGICAL AWARENESS AND ITS IMPACT ON
COMPOSITIONAL AUTHORITY IN MUSIC EMPLOYING ELECTRONICS

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ABSTRACT

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A body of music exists that to varying degrees surrenders compositional decisions to environmental observation. Many composers utilizing electronics allow an increasing awareness of climate change and human impact on our shared environment to influence their work in some regard. In many cases, this is accompanied by the notion of removing themselves (i.e., their authority as the composer) from the compositional process. This document brings diverse repertoire together to explore the various nuances of climate cognizance permeating the end result of a work.

Offered is an examination of how environmental awareness impacts the degree to which a composer, utilizing electronics, relinquishes musical decisions. Chapter One identifies the subject matter and existent scholarly literature, expanded through discussion of major figures like John Cage, Pauline Oliveros, and Olivier Messiaen, as well as free improvisation. Chapter Two explores the means in which composers utilize the soundscape, viewed through established areas such as field recording, acoustic ecology, soundscape composition, sonification, and ecoacoustics. Chapters Three through Five examine the work of Hildegard Westerkamp, Matthew Burtner, and Jez Riley French. Chapter Six offers additional environmental views and social concern, working toward an aesthetic which may be posited as aligning with found composition.

To Deborah Lynn Kasprzyk, in loving memory.

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CHAPTER ONE. QUESTIONING ARTISTIC AUTHORITY

1.1 IDENTIFICATION AND DISCUSSION OF SUBJECT MATTER

Nature's influence in music is ample and extends well into history; Antonio Vivaldi's *Le quattro stagioni* (1723), for example, gives musical expression to each season and is often known, at least aurally, by a great majority of individuals. In the 20th-century, however, there is an increase of music that moves beyond mere influence, acknowledging environmental degradation and utilizing electronics. Even more specifically, a body of music now exists that to varying degrees surrenders compositional decisions to an environment. The aural relationship between these works and the integrated environment can be quite tangible. Many composers utilizing electronics incorporate an increasing awareness of climate change and human impact on our shared environment as influence on their work in some regard. In many cases, this is accompanied by the notion of removing themselves (i.e., their authority as the composer) from the compositional process. This document brings diverse repertoire together to explore the various nuances of climate cognizance permeating the end result of a work.

Specifically, examination of how environmental awareness impacts the degree to which a composer utilizing electronics relinquishes musical decisions will be presented. This will be chiefly investigated through analysis of three works: Hildegard Westerkamp's *Beneath the Forest Floor* (1992, fixed media), Matthew Burtner's *Sikuigvik* (1998, piano and large ensemble), and Jez Riley French's *resonances di topolo* (2012, untreated field recordings and locale). Analysis will not explore all facets of each piece, but rather extensively highlight the specific components (e.g., form, harmony) that adhere to the document's focus. As a result of

direct insight from these composers, focus will be drawn to a variety of established movements (e.g., acoustic ecology, ecoacoustics) that demonstrate the varied approaches and aural results.

1.2 EXISTENT SCHOLARLY LITERATURE

While a composer's activity poses no provision to document their methods into a scripted theory, examples exist and prove to be valuable resources. Olivier Messiaen's (1908-1992) *The Technique of My Musical Language* (1966) or Iannis Xenakis' (1922-2001) *Formalized Music: Thought and Mathematics in Composition* (1971) are among many texts now considered a standard resource to composers, offering direct insight to methods used by a historically significant composer. Those figures highlighted in this document, including John Cage, Pauline Oliveros, Westerkamp, Burtner, and French, have also provided scholarship. *Silence: Lectures and Writings* is a collection of Cage's essays from 1939 to 1961. More recently, Westerkamp and Burtner have written on trends defining aesthetic placement for their work and others. However, research that examines how much an artist surrenders to what they observe within an environment has not clearly presented itself in scholarly writing. Details of these ideas will present themselves in later chapters through varied repertoire. Under the auspices of environmentally focused works with electronics, this document hopes to provide insight in this regard, adding to the body of existing literature.

1.3 ENSUING STRUCTURE

In presenting what follows, exploration of predecessors to modern trends is initially offered, contributing evidence of artists who questioned their role as creator. This includes John Cage and his contemporaries, both in music and visual arts, Pauline Oliveros, Olivier Messiaen,

and those associated with free improvisation. Next, illustration of a number of fields that are employed in the work of composers found in this document, including field recording, soundscape composition, sonification, acoustic ecology, and ecoacoustics will be detailed. To provide examples of composers' partially abdicated role, analysis of works by Westerkamp, Burtner, and French are offered. With this information, definition can be proposed for found composition, as detailed in the final chapter.

1.4 PREDECESSORS

For many, expectations are that a composer dictates what will occur and the performer(s) faithfully execute this prescription. There are numerous examples of imbalance to this structure, as seen with indeterminacy, which demonstrates ways in which composer or performer are found in a less definitive musical situation. American composers Charles Ives (1874-1954), followed by Henry Cowell (1897-1965), produced early examples of aleatoric music, generating elasticity in their music through performers who made compositional decisions, on occasion in real time. Performers may determine how many times a segment is played, its order, or even make decisions of pitch and duration.¹ In the case of indeterminacy by means of performance, the aural results could vary with each presentation of a work. Despite a fixed score being offered, performers' decisions generate a unique aural result. It is with John Cage, however, that indeterminacy precedes the completion of the score itself.

¹ Don Michael Randel, *The New Harvard Dictionary of Music* (Cambridge: The Belknap Press of Harvard University Press, 1986), 28-29.

1.4.1 John Cage

Colorful, controversial, and crucial to the world of music and beyond, John Cage (1912-1992) was a composer of significant impact. Early on, he studied with figures like Henry Cowell and albeit brief, Arnold Schoenberg (1935-1936), but had also taken interest in art and architecture for a time. Music ultimately became his most lasting and noted focus. He taught at numerous institutions throughout the United States, and by the 1930s was widely considered a leader among the world's avant-garde movement. His interest in percussion, alongside his personal and professional relationship with the dancer and choreographer Merce Cunningham (1919-2009), led to Cage's invention of the "prepared piano" (i.e., a piano with objects placed within it or in between strings to produce percussive or other timbres atypical of the instrument). Cage's work paved the way for aleatoric techniques and free-form improvisatory works. Of note in this document, however, was his blatant and innovative use of noise and silence in music.²

Briefly, those acquainted with tape music in America will be familiar with Vladimir Ussachevsky (1911-1990) and Otto Luening (1900-1996). Considering France's *musique concrète* and Germany's synthesized offerings, they composed America's first examples of tape music, including a 1952 live broadcast at the Museum of Modern Art (New York). Quite notable were their efforts founding the Columbia-Princeton Electronic Music Center³ in 1959 with Milton Babbitt (1916-2011) and Roger Sessions (1896-1985).⁴ There was little delay for Cage to also utilize technology in his work, producing for example, his tape piece *Imaginary Landscape V* in 1952.

² Larry Austin, "John Cage: 1912-1992," *Computer Music Journal* 16, no. 4 (1992): 11.

³ N.B. this is now called the "Computer Music Center (CMC) at Columbia University."

⁴ Vladimir Ussachevsky, "Columbia-Princeton Electronic Music Center." *Revue Belge De Musicologie / Belgisch Tijdschrift Voor Muziekwetenschap* 13, no. 1/4 (1959): 129-31.

Cage was not just influenced by visual arts, but produced numerous paintings of his own. He was in contact with painter and graphic artist Robert Rauschenberg (1925-2008), whose bridge between art and life will be detailed later. He was quite aware of Rauschenberg and László Moholy-Nagy's (1895-1946) work, as well as Jasper Johns' (b. 1930) sculpture-painting hybrids. The readymades of Marcel Duchamp (1887-1968) undoubtedly caught Cage's focus, including *Fountain* (1917), which consisted of an inverted urinal, and *The Bride Stripped Bare by Her Bachelors, Even* (1915-23). "It is this idea of transparency, of a space or emptiness that allowed the artwork to open up to the environment, that formed the primary difference between the historical phase of dada and its neo-dada incarnation and separated Duchamp from his counterparts."⁵

Both influencer and prognosticator, Cage spoke of individuals not debating consonance and dissonance, but of questioning the use of noise in music, aided in part through electronics. This conviction aligned with his diplomatic phrasing of music defined as "organization of sound." Cage predicted the organizer (i.e., composer) would come to have the entire field of sound at her or his disposal, as well as the full field of time. "The 'frame' or fraction of a second, following established film technique, will probably be the basic unit in the measurement of time. No rhythm will be beyond the composer's reach."⁶ In considering the treatment of musical material, with particular consideration for the role of electronics, Cage's thoughts became accurate.

What constitutes a work being indeterminant can be contended in a variety of ways. Cage saw both Karlheinz Stockhausen's (1928-2007) *Klavierstück XI* (1956, piano) and Johann Sebastian Bach's (1685–1750) *The Art of Fugue* (ca. 1742) as examples. Stockhausen provides

⁵ Branden W. Joseph, "White on White," *Critical Inquiry* 27, no. 1 (2000): 102.

⁶ John Cage, *Silence* (Middletown, CT, Wesleyan University Press: 1961), 3.

license to the performer in determining form; the sequence of each section of music is not specified. The perhaps unexpected example of Bach is illustrated in that the score lacks timbral and amplitude direction, generating a unique overtone structure or decibel range to each performance—the performer as colorist. More importantly, it lacks specified instrumentation.⁷

Specific to indeterminacy in music composition, Cage had both immediate and lasting influence. He had close association with Morton Feldman (1926-1987) and Earle Brown (1926-2002) in the 1950s, both of whom utilized graphic notation (i.e., scores that employ visual materials other than conventional music notation in hopes of inspiring or motivating certain activities of the performer, permitting a great deal of freedom).⁸ A younger generation, including Nam June Paik (1932-2006) and the Fluxus movement, as well as Morton Subotnick (b. 1933), Pauline Oliveros, and others of the San Francisco Tape Center, also had significant exposure to Cage. His presence was felt in Europe as well, having met with Stockhausen and Pierre Boulez (1925-2016). Their indeterminacy, however, had a comparatively limited range of choices. Stockhausen's *Zyklus* (1959, solo percussion) for example, yields temporal placement of material to the performer. The unlikely friendship of Boulez and Cage existed between 1949-1954 before Boulez's true dismissal of non-serial composition.⁹ Those aware of Boulez and his work would understandably doubt the compositional giant citing Cage as an influence. His *Structures Ia* (1952, two pianos), however, bears resemblance to *Music of Changes* (1951, piano). Similarly, the forces of Boulez's *Poésie pour pouvoir* (1958, magnetic tape (narrator) and three orchestras) may aurally push one to recall the eight simultaneously played tapes of Cage's *William's Mix* (1953, magnetic tape, octophonic). Both of Cage's pieces were sent to Boulez amid their

⁷ John Cage, *Silence* (Middletown, CT, Wesleyan University Press: 1961), 35.

⁸ Randel, *New Harvard Dictionary*, 346.

⁹ Grant Chu Covell, "1951 and Cage's Music of Changes," La Folia, <http://www.lafolia.com/1951-and-cages-music-of-changes/>.

relations.¹⁰ Their compositional techniques varied immensely, but the composers, though not admittedly, exhibited common thought.

In much of Cage's body of work we see indeterminacy within the compositional process, not during the interpretation of the score. One inevitably looks to the aforementioned *Music of Changes*, Cage's first complete work determined by random procedures. (Within the last movement of the Concerto for Prepared Piano and Chamber Orchestra (1951), Cage began working with a method of indeterminacy in the compositional process.) The pitches, rhythms, and other components of *Music of Changes* are not a product of the composer's decision but rather, the result of tossing of coins. One must acknowledge this dichotomy of chance (i.e., tossing coins) versus the composer assigning their meaning (i.e., how the coins determine what composed musical material will be used). Brief study with Schoenberg may have provided the impetus for this and other rigorous systems later utilized by Cage.

In 1951, however, composer Christian Wolff (b. 1934) gave Cage a copy of the *I Ching*, which had notable impact and is to what the title, *Music of Changes*, alludes.¹¹ Originally a divination manual from the Western Chinese Zhou period (1000-750 BC), the text is an attempt to gain insight through process or ritual.¹² Like the *I Ching's* 64 hexagrams, Cage created charts with the same number of segments, offering a variety of pitch material, durations, dynamics, densities, and other parameters. Just as one commonly would with this book of oracles, Cage tossed coins, using the results to select musical material that corresponded with his charts. The composer forfeited his privilege to decide what material within his charts would be used in the

¹⁰ Grant Chu Covell, "1951 and Cage's Music of Changes," La Folia, <http://www.lafolia.com/1951-and-cages-music-of-changes/>.

¹¹ Covell, "1951 and Cage."

¹² Philip M. Peek, *African Divination Systems: Ways of Knowing* (Bloomington: Indiana University Press, 1991), 2.

work, synthesizing chance with discipline. An “exploration of non-intention,”¹³ the coins possess a significant role in the compositional process. This unpredictability equally embraces mistakes, “for once anything happens it authentically is.”¹⁴

Other works have definitive shape but also neglect to have complete compositional authority. *TV Köln* (1958, piano) is a single page with four systems plus an instructional page. Each system is of equal duration, yet no duration is indicated. The performer is asked to play in specific areas (e.g., on the keys, inside the piano, somewhere other than the instrument). The score is representative of how the sounds are produced, not what they actually are.¹⁵

Similarities are found between *Music of Changes*, Cage’s *Imaginary Landscape No. IV* (1951, 12 radios), and other works that followed. The latter exhibits another interpretation of indeterminacy in that the musical material itself is left undecided by the composer. Specific instructions are given to the performers, but ultimately the available radio programming, location, and time of the performance determines what the radios sound.¹⁶

This premise is exemplified in his most known work, *4’33”* (1952). The piece, scored for any instrument or combination of instruments, indicates duration and has three movements; the performer, however, does not play.¹⁷ We hear the room, the audience, and any sound in or nearby the performance space. Cage exerts no control over what we hear, but simply provides the framework. In doing so, he provides “context within which performers can carry out various types of activities, and within which any type of sound can have as much, or as little,

¹³ John Cage, “An Autobiographical Statement,” John Cage, http://www.johncage.org/autobiographical_statement.html.

¹⁴ Cage, *Silence*, 59.

¹⁵ Robert P. Morgan, *Anthology of Twentieth-Century Music* (New York: W.W. Norton & Company, 1992), 316-8.

¹⁶ Joel Lester, *Analytic Approaches to Twentieth Century Music* (New York: W.W. Norton & Company, 1989), 296.

¹⁷ N.B. *4’33”* was premiered in 1952, in Maverick Concert Hall, Woodstock, New York, by pianist David Tudor.

significance as any other. The ‘music’ only results from the experience of performing, which varies each time the score is realized.”¹⁸

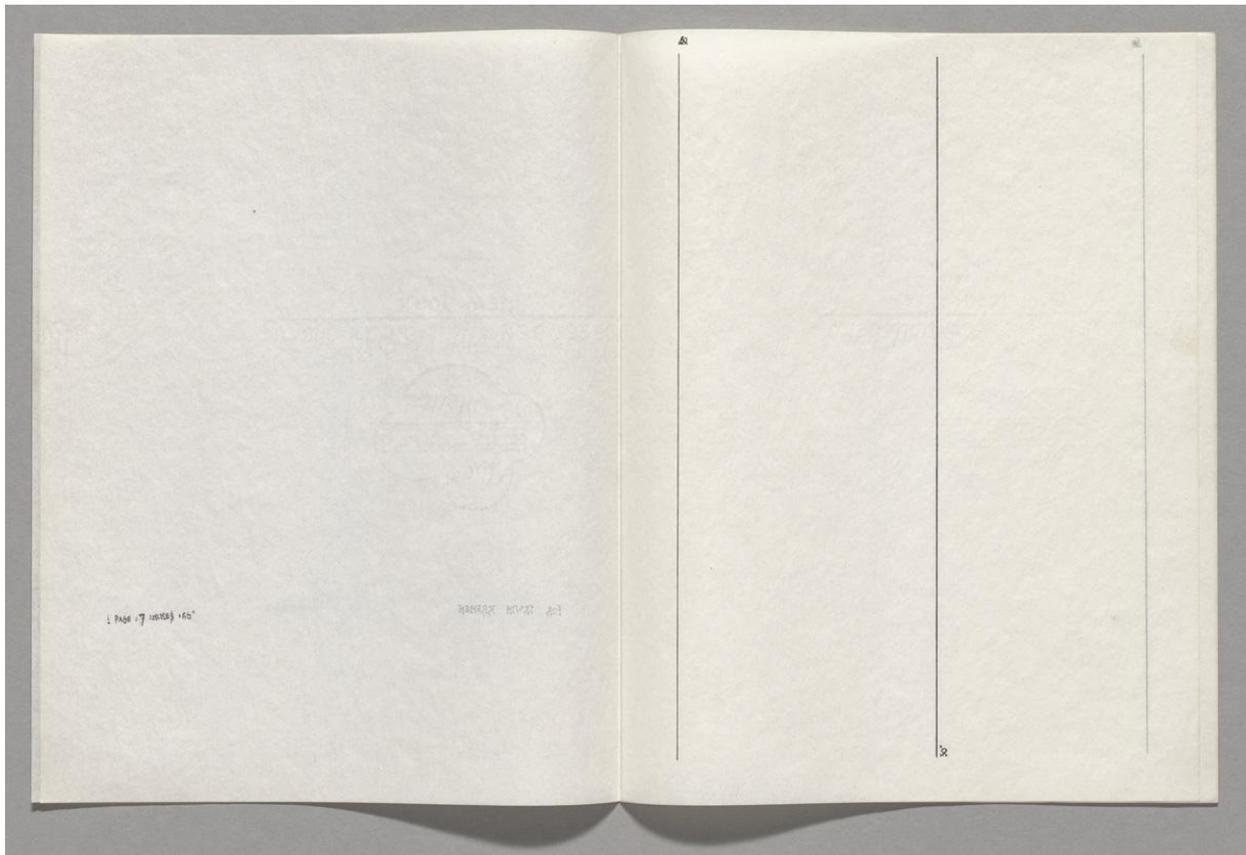
This work also solidifies Cage’s views of Rauschenberg, whom he met the year before composing *4’33”*. Cage even wrote, “To Whom It May Concern: The white paintings came first; my silent piece came later.”¹⁹ Rauschenberg’s *White Paintings* (1951), a set of large panels painted white but intended to look untouched, were even visually referenced by the original *4’33”*, which was a spatial score of blank paper with long vertical lines that indicated where movements of the work would begin or end. (See Figure 1.1 below.) Cage did experience time in an anechoic chamber (i.e., a room that completely absorbs reflection of sound), but this experience is predictable and lacks the environmental noises that embody a performance of *4’33”*.²⁰ Indeed the *White Paintings* not only provided Cage confidence, but had him question music’s development against that of art.

¹⁸ Morgan, *Anthology of Twentieth-Century Music*, 317.

¹⁹ Cage, *Silence*, 98.

²⁰ Joseph, “White on White,” 107.

Figure 1.1: John Cage 4'33", 1952. Score in Proportional Notation.²¹



1.4.2 Pauline Oliveros

For over a half-century, composer, performer, and humanitarian Pauline Oliveros (1932-2016) was a pioneer in music. Her presence is felt today, as displayed in a life working with the most innovative technology available, blended with improvisation, meditation, and a firm command on listening. She boasted three honorary doctorates, was a key figure in the San Francisco Tape Music Center, and taught at numerous notable institutions, including Mills

²¹ Hrag Vartanian, “The Original: John Cage, “4’33” (In Proportional Notation) (1952/1953),” Hyperallergic, <http://hyperallergic.com/85779/the-original-john-cage-433-in-proportional-notation-19521953/>.

College, University of California at San Diego, Oberlin, Northwestern, and Rensselaer Polytechnic Institute.²²

It is Oliveros' *Deep Listening* pieces and other compositional output, that brings her to this document's focus. One must first consider the social and cultural elements from within the time she began gaining musical distinction. Following the 1960s' push for racial equality, the 1970s included the killings at Kent State University, the Vietnam War, and Watergate. A strong progressive spirit was also present, which focused on civil rights, peace, and gender equality. This was given voice in the words of Allen Ginsberg, seen through Andy Warhol, and heard in the work of John Cage. Expanded consciousness through meditation, eastern religions, and psychedelics followed suit.²³

German philosopher Theodor Adorno (1903-1969) had died, but his firm stance on criticizing society through music's formal structure was likely still felt. American composers like David Del Tredici (b. 1937) and George Rochberg (1918-2005), as well as minimalists like Philip Glass (b. 1937) and Steve Reich (b. 1936), unapologetically used tonal material, undermining the idea that music should confront its embedded history. Those advocating Adorno's thoughts would promote musical material that ignores commodification to offer a more rational and humane form of consciousness.²⁴

The *Sonic Meditations* (1974) of Oliveros can be seen as a product of and within the culture of the aforementioned times. This musical-meditative composite existed in prose, not in standard notation, offering strategies for listening that are performed by any group of individuals. This and other works inspired Christian Wolff to draw comparisons between Oliveros and the

²² Pauline Oliveros, "About," Pauline Oliveros, <http://paulineoliveros.us/about.html>.

²³ Stephen Miles, "Objectivity and Intersubjectivity in Pauline Oliveros' 'Sonic Meditations'," *Perspectives of New Music* 46, no. 1 (2008): 5.

²⁴ *Ibid.*

theatrical elements of Mauricio Kagel (1931-2008), as well as Stockhausen's 1968 text composition, *Aus den sieben Tagen*.²⁵ The presentation, form, and materials of *Sonic Meditations* indeed negates conventional approach to musical meaning, but the active embrace of works as a communal experience (i.e., music not as a specialized practice but performed in this case by *any* individual) seems romanticized and contrary to Adorno's assessment. Adversely, Oliveros' work invites engagement with the world on a multitude of levels. Meditation, as will be illustrated, can embrace attention brought to imagined, remembered, and present information within one's environment (i.e., addressing the conscious, subconscious, objective, and subjective environment).²⁶ These works came to life through her ♀ Ensemble, an entirely female, largely vocal-based improvisation group, mixed with professional and nonprofessional musicians, whose focus rested on the cognition of sound. This ensemble of equality targeted the imagination and making of sounds, listening to those present, and remembering others.

Looking to the multitude of disciplines that led to the *Sonic Meditations* and other Oliveros works, one addresses various facets of meditation. Found both in religious and secular practice, this act activates a mode of consciousness to bring about some benefit for the mind to "acknowledge its content without becoming identified with that content, or as an end itself."²⁷ Oliveros' secular viewpoint specifically addresses attention, concentration, openness, and repetition, as actuated through steady attention and awareness for extended or cyclic time periods. Attention, which can be selective and narrow, and awareness, a more broad inclusive

²⁵ Amy C. Beal, "Christian Wolff in Darmstadt, 1972 and 1974," in *Changing the System: The Music of Christian Wolff*, ed. Stephen Chase (United Kingdom: Routledge, 2016), 33.

²⁶ Stephen Miles, "Objectivity and Intersubjectivity in Pauline Oliveros' 'Sonic Meditations'," *Perspectives of New Music* 46, no. 1 (2008): 4.

²⁷ Antoine Lutz et al, "Attention regulation and monitoring in meditation," *Trends in cognitive sciences* 12, no. 4 (2008): 163.

view, both have a range with which one can adjust. Meditation practice frequently yields healing, heightened states of awareness, and other benefits.

Hearing is both an active and receptive sense and finds itself the focal point of the *Sonic Meditations*. The works frequently provide examples of Oliveros' use of drones. She astutely notes in the age of *hum*, rather than *Om*, that drones are a conscious and unconscious inevitable presence amid a time prevalent with motors, lights, and freeway noise.²⁸ One may look to Terry Riley (b. 1935), La Monte Young (b. 1935), or even Giacinto Scelsi (1905-1988), for additional use of single tones that preceded Oliveros. Additionally, her egalitarian *fem* Ensemble moves away from goal-oriented vocal production, embracing involuntary alteration to one's voice. Untrained musicians feel comfort in an environment that admonishes opinion, desire, and speculation, as seen in traditional vocal training. An example is *Teach Yourself to Fly, Sonic Meditation I* (1971). The work, originally passed along orally, was eventually written as follows:

Any number of persons sit in a circle facing the center. Illuminate the space with dim blue light. Begin by simply observing your own breathing. Always be an observer. Gradually allow your breathing to become audible. Then gradually introduce your voice. Allow your vocal cords to vibrate in any mode which occurs naturally. Allow the intensity of the vibrations to increase very slowly. Continue as long as possible, naturally, and until all others are quiet, always observing your own breath cycle. Variation: translate voice to an instrument.²⁹

The piece brings observation of breathing to the forefront, but moves a step further in a multitude of ways. Executed as instructed, one balances attention and awareness without consciously manipulating the environment. Participants are receptive. A complementary relationship of attention, awareness, conscious observation, and unconscious observation is generated.

²⁸ Pauline Oliveros, "On Sonic Meditation," *Painted Bride Quarterly* 3, no. 1 (1976): 138-9.

²⁹ Bradford Bailey, "Pauline Oliveros' Sonic Meditations (1974) The Complete Text and Scores," *The Hum*, <https://blogthehum.wordpress.com/2016/09/13/pauline-oliveros-sonic-meditations-1974-the-complete-text-and-scores/>.

Additionally, distinctions of performer and audience, or professional and amateur, are eliminated.

The interaction that occurs in Oliveros' work demonstrates that mere observation does not exist, aligning with the thoughts of physicist Werner Heisenberg (1901-1976). His work in quantum theory reveals that observation alone can alter an object. Oliveros also notes that physicist Otto Frisch (1904-1979) felt "every observation we make is bound to act on the object we observe, even if only by the impact of a single quantum of light. In other words, there is always a mutual inter-action between the observer and the object."³⁰ In *Teach Yourself to Fly*, breath may change if attention is brought to the circle of participants. A drone frequently exists despite no pitch center being proposed. Global dynamic changes form the piece in the absence of a conductor. Oliveros yields the input one would traditionally expect of a composer, yet similarities can be found in multiple performances.

Another notable and collaborative work of Oliveros is found with the *Deep Listening Band*. With accordion in tow, alongside trombonist Stuart Dempster (b. 1936) and vocalist Panaiotis (aka Peter Ward), Oliveros explored physical spaces in an improvised setting. The trio, for example, was performed within Fort Worden Cistern, a 2-million-gallon space that boasts a 45-second reverberation time. The 1988 performance and subsequent recording, featured the musicians and the cistern. As with her other sonic practices, a balance of high attention is drawn to the sounds one makes, their collaborators, and the space itself. Similar efforts have followed, including *Non Stop Flight* (1996), a four-hour and thirty-three minute trope.

Born in part from works like the *Sonic Meditations*, Oliveros founded the *Deep Listening Institute*, an organization that includes interactive performances, annual retreats, certification,

³⁰ Pauline Oliveros, *Software for people: collected writings 1963-80* (Baltimore: Smith Publications, 1984), 150.

and other programs that promote a heightened state of awareness and connectedness. It is a promotion of “listening in every possible way to everything possible to hear no matter what you are doing.”³¹ In founding *Deep Listening*, Oliveros promotes what she finds imperative in an artist’s work: to cultivate creativity in others. Central to this practice are values that align with much of the aforementioned, including empathy, nonhierarchical social relationships, and uncritical perception. The latter undoubtedly nods to Cage’s work in the 1950s and an appropriation of Zen Buddhism. (Oliveros’ had been a practicing Tibetan Buddhist for decades.) In blurring the boundary between perceiver and perceived, ego is unable to persist and full awareness can be achieved.³²

A fusion of this aesthetic with ever-evolving technology is found in her work, *The Lightning Box* (1990). The hour-long sound meditation is a collaborative project that features computer-controlled delay processors and lighting. Performers not only listen to their sound, but also respond to modified reiterations of their performance that are offered by the electronics. Unlike the physical spaces *Deep Listening Band* explores, delay times alter throughout. Her work lives on today, under the auspices of pieces that are a product of consistently listening to everything, in both acoustic pieces for people without musical training, to those utilizing the latest in music technology.

1.4.3 Olivier Messiaen

One would be remiss not to mention one of 20th-century music’s most prominent figures, Olivier Messiaen. The French composer was also an organist, pairing well with the theological

³¹ Pauline Oliveros, “About Deep Listening Institute,” *Deep Listening*, <http://deeplisting.org/site/content/about>.

³² William Osborne, “Sounding the Abyss of Otherness: Pauline Oliveros’ Deep Listening and The Sonic Meditations,” Osborne-Conant, <http://www.osborne-conant.org/oliveros.htm>.

views infused throughout his work. His life was significantly impacted by World War II; he wrote and premiered *Quatuor pour la fin du temps* (1941, piano, violin, cello, and clarinet), alongside his fellow prisoners of war. He was a noted educator, having taught at the Paris Conservatoire and mentored an exhaustive list of distinguished students, including Pierre Boulez and Karlheinz Stockhausen.³³ It is worthy to also mention his students Gérard Grisey (1946-1998) and Tristan Murail (b. 1947), who are frequently associated with the genesis of spectral music. This composition technique values sound and time, versus pitch and rhythm, heavily relying on technology.³⁴ While beyond the scope of this document, spectralism yields additional examples of music utilizing electronics looking heavily to the natural world.

In Messiaen's *Mode de valeurs et d'intensités* (1950, piano), each pitch is assigned a corresponding dynamic and articulation. Efforts like this provide a lineage to the total serialism seen in *Structures, Book I* by Boulez or *Kreuzspiel* by Stockhausen (1951, oboe, bass clarinet, piano and three percussionists).³⁵ This contrasts what is most relevant at this juncture in discussing the highly representative resources he used (i.e., *musique concrète* and birdsong). Through his ornithological knowledge, one could view his use of birdsong as being akin to the electronic efforts of Pierre Schaeffer (1910-1995) in the mid-1900s. Messiaen even offered his own contribution to *musique concrète* with the piece, *timbres-Durées* (1952). From his first birdsong work, *Réveil des oiseaux* (1953, piano and orchestra) onward, the transcriptions did

³³ Donald Jay Grout, and Claude V. Palisca, *A History of Western Music* (New York: W.W. Norton & Company, 2010), 726-29.

³⁴ Joshua Fineberg, "Guide to the Basic Concepts and Techniques of Spectral Music," (*Contemporary Music Review* 19, no. 2, 2000), 81.

³⁵ *Ibid.*

exist in *the field* but, he also made extensive use of commercial recordings to translate birdsongs into conventional music notation.³⁶

Musicologist Robert Fallon has compared sonograms alongside Messiaen's work to ascertain the accuracy of these transcriptions. There are practical considerations, such as the range of a bird call compared to that of human and instrument limitations, or the frequency rounding Messiaen had to consider in applying inherently microtonal birdsong to an instrument's temperament.³⁷ In general, however, Messiaen matches pitch and generates rhythms true to the temporal placement of birds' calls.

Deviations exist, however, that are employed for reasons beyond the practical. There are occasions when repetition found within a bird's call may vary from the original. (At times, Messiaen used prime numbers to determine phrase durations.) Additionally, Messiaen almost always places the transcribed bird melody on top of a harmonization of his own. While these harmonies relate more to his synesthesia, they do not exist to have acoustic instruments perform something that could be aurally confused with the bird itself.³⁸

One could see the aforementioned as inevitable poetic license in creating a musical work derived from nature (i.e., birdsong). The use of this material is somewhat akin to Surrealism and *musique concrète*; the birds can be reduced to themselves (i.e., heard as birds), provided in the form of imitative transcriptions, and serve a symbolic role. Messiaen viewed the bird as representational of nature, created by God, and therefore aligning with his religious views. He identifies specific birds used in the highly representational work, *Vingt Regards sur l'Enfant-*

³⁶ Robert Fallon, "The Record of Realism in Messiaen's Bird Style," in *Olivier Messiaen: Music, Art and Literature*, eds. Christopher Dingle and Nigel Simeone (United Kingdom: Routledge, 2007), 117.

³⁷ Fallon, "The Record of Realism," 115.

³⁸ *Ibid.*, 120.

Jesus (1944, piano) as signifying joy or freedom. The birds are a part of his endless palette of musical devices.³⁹

1.4.4 Improvisation

Composing, for Arnold Schoenberg, was “slowed-down improvisation”⁴⁰ in which ideas cannot be written fast enough. One may view some written compositions as improvisations possessing varying degrees of revision. That is to say, a composer may improvise written musical material over a longer period of time, potentially offering the final results in written form. In considering the foci of this document, it would be remiss not to briefly draw attention to the world of improvisation. As previously noted, graphic scores were utilized by Cage and many others, including Mauricio Kagel, Krzysztof Penderecki (b. 1933), and Iannis Xenakis. More recently, Will Redman (b. 1975) penned a collection of 98 graphic works called, *Book* (2006), exemplifying flexibility of interpretation and presentation.⁴¹ Additionally, Oliveros aurally passing *Teach Yourself to Fly* may be viewed as improvisatory to some degree. One may look to spontaneity, absence of traditional notation, or singularity of the aural results in exploring definition.

Improvising inherently implies presentation without preparation, but those astute to much of jazz’s history recognize that the surface level magic of spontaneity is extremely rehearsed. In a rarefied sense, jazz musicians are presented with a melody and a repeated set of chord changes, the latter of which serves as framework for their performance. Traditionally, one can reference their substantial training or experience, offering a vast vocabulary from which to draw. Cage

³⁹ Fallon, “The Record of Realism,” 131.

⁴⁰ Arnold Schoenberg, “Brahms the Progressive,” in *Style and Idea* (New York: Philosophical Library, 1950), 439.

⁴¹ Will Redman, “Unsystematic Music,” *Unsystematic Music*, <http://www.willredman.com/unsystematic.html>.

expressed objection to improvisation in this context, as in his view it could only produce music based on habit, as opposed to uncharted revelations. (This feeling subsided toward the end of Cage's life.)⁴² Like the music itself, the degree to which one challenges the structure of a work through her or his improvisation evolved throughout history. Modern British saxophonist Evan Parker (b. 1944), whose seemingly polyphonic improvisations generate walls of sound, still views his place among the African-American jazz tradition, moving from the context of John Coltrane (1926-1967), Eric Dolphy (1928-1964), to Cecil Taylor (b. 1929) and beyond.⁴³ Regardless, improvisation, in its many facets, fundamentally demonstrates that some aspect of the music is not predetermined; the initial creator has not exerted full potential.

An exemplary improvisational world is found among performers of free improvisation. Including jazz or other structured improvisation, Western art and popular musics possess a conscious identification of composer or performer with regard to musical decisions, offering pre-established structures and identification that aid in the realization of a work. In a world where all choices are valid, free improvisation abandons already established notions that may confine the musical results into a world where predictability is viewed as a necessary function. Those producing free improvisation are the performer and composer. Akin to *musique concrete*, free improvisation can be a performance of sophisticated interaction, where any sound may be utilized.⁴⁴ Most people experience a degree of uncertainty, even with mundane items such as traffic's impact on one's commute; musicians are often trained to reduce uncertainties that may impact their performance. The free improviser, short of perhaps having knowledge and command of their respective instrument, embraces uncertainty.

⁴² David Borgo, *Sync or Swarm, Improvising Music in a Complex Age* (New York: Continuum, 2007), 21.

⁴³ Graham Lock, "After the New: Evan Parker, Speaking of the Essence.," *The Wire* 85 (1991): 30.

⁴⁴ Trevor Wishart, *On Sonic Art* (Amsterdam: Overseas Publishers Association, 1996), 36.

Though not exclusively, the world of free improvisation includes individuals from both classical and jazz traditions, but does not prominently live among those fields pedagogically or in presentation. Accolades can be cited, however, including Neil Feather's (b. 1956) acquiring of a 2016 Guggenheim Fellowship. Dubbed a sound mechanic, Feather has performed internationally on instruments of his own devising, utilizing springs, magnets, motors, and bowling balls to create devices that are physical both aurally and in appearance. At home in Baltimore, Feather is an influential figure in the city's free improvisation scene, which hosts the High Zero Festival (one of the world's noted festivals dedicated to improvised music) and regular performances that frequently occur at a variety of venues.⁴⁵

Another noted figure in free improvisation is saxophonist Jack Wright (b. 1942), who has spent decades developing and integrating non-idiomatic techniques that, contrary to what one sees, initially have one question if electronic manipulation is being incorporated. By virtue of the openness of free improvisation, the music benefits from development of a personal style; those aware of Wright recognize his musical voice. His writings reflect what one may experience among similar performers, touting disinterest in that which musicians traditionally aspire (e.g., accolades, performances in prominent venues). Playing in public is not motivation, and thus the music does not come from his "self." Wright acknowledges the environment (i.e., his daily aural intake) as persuasive and finds the results occur partly by accident. Contrarily, he admonishes the term experimental, distinguishing himself from those who may have less sense of what their actions may produce.

Wright and others perform both with acquaintances, and those with whom they have never met. Traditionally, no established mode of attack is uttered. Performers listen to each other

⁴⁵ Neil Feather, "About," Neil Feather, <http://neilfeather.com/about/>.

and the space in which they perform, embracing the idea that everything is free only at its moment of creation; reproduction or replicas can only offer more of what was previously known. Wright feels this activity (i.e., free improvisation) “stands at the center of music because it is the insecure void between past and future, the voice of choice.”⁴⁶ A society’s culture may be defined through repetition and development. This holds true in many arts, which tempt musicians with acceptance recognition, exhaustively offering Hegelian categories from which to measure the validity of one’s work. Challenging rationality, pre-established musical material, and the aforementioned societal models, are items avoided in free improvisation.

This social subversion is embedded in free improvisation, viewing aesthetics as predetermination of what is valid and definition as what can have form. The experienced free improviser may work with sound and silence in spite of pressures to fulfill their musical role, as established by sources related more to prearranged musical or professional expectations. Wright feels “one doesn’t even play ‘outside the box,’ when any box that begins to appear gets flattened.”⁴⁷ As performers may cite their life experience as persuasive to their musical endeavors, one may see similar organization in the natural world. A stream of water is a large stable body generated from rapidly changing smaller components. Similarly, performances in an improvised setting frequently include a democratic approach of musicians, avoiding top-down schemes and accepting the aforementioned lack of rules and expectations.⁴⁸ The dichotomous world of composition and improvisation—deliberation and spontaneity—is left within the Euro-

⁴⁶ Jack Wright, “Essays and Thoughts,” International Improvised Music Archive, http://intuitivemusic.dk/iima/jackw_essays.htm.

⁴⁷ Wright, “Essays and Thoughts.”

⁴⁸ Borgo, *Sync or Swarm*, 122.

American art music culture, leaving free improvisation to a world where musical decisions are collectively made among all present. The creator(s), observers, and physical space unite to determine what will come to be in that moment.

CHAPTER TWO. UTILIZING THE SOUNDSCAPE

2.1 INTRODUCTION

Exploring the influence of Cage, Oliveros, and others, as discussed in the previous chapter, one can look to numerous musical areas in which the soundscape is utilized. According to R. Murray Schafer (b. 1933), we could define soundscape as “any acoustic field of study,”⁴⁹ but to delve further, a number of areas that incorporate electronics and environmental concern are offered in this chapter. These include field recording, soundscape composition, sonification, acoustic ecology, and ecoacoustics. Defining these allows for meaningful discourse as the document progresses.

2.2 FIELD RECORDING

One of numerous terms imperative to the scope of this document is field recording. A literal interpretation (i.e., to record in a field) falls short of what is encompassed. In contrast to the type of recording with which many musicians may be familiar within a highly controlled space exhibiting minimal extraneous sound, field recording is audio recording conducted outside a recording studio. This comes without exception—acquiring any sounds produced by life, nature, or anything else present. Noted field recordist and ecologist Bernie Krause (b. 1938) categorized the diverse sounds one may record into three categories. Geophony refers to non-biological sounds produced by the earth (e.g., wind, water). Sounds made by the species of the recorded area are classified as biophony, while human generated sounds of any kind are referred to as anthrophony.

⁴⁹ R. Murray Schafer, *The Tuning of the World* (New York: Knopf, 1977), 99.

Field recording, recording ostensibly in “the field” instead of a recording studio, provides discernible explanation. That said, one may frequently find phonography used to describe the same activity. Phonography, quite literally “sound-writing,” purposefully alludes to photography. As with phonography, earlier photography was rooted in documentation. It gradually amassed aesthetics found in other visual fields such as painting, and progressively shifted toward the abstract (i.e., audio manipulated to greater degree). One sees the parallel when comparing photographs of the early 1900s to those of American photographer Minor White (1908-1976), for example.⁵⁰

Field recorder and sound designer Nathan Moody (b. 1971) notes additional parallels with photography. The gathering of gear and traveling out to collect moments in time provides an obvious parallel, alongside exploring different perspectives, chasing perfect lighting (or timbre), and exploring foreground and background, (signal-to-noise ratio). While sound is experienced in time, recording removes sounds from their original timeline, offering the ability to reproduce or repeat at leisure. Therefore, both photography and field recording exhibit temporal abstraction. This is taken further in the form of recontextualization (i.e., removing the original environment, which produces the opportunity for new meaning and interpretation). Finally, as each field is typically more conducive to working as an individual, each offers inevitable solitude and introspection.⁵¹ These parallels are observed in an overt sense through numerous figures actively working in both disciplines. Irving Teibel (1938-2010) was an early figure known in phonography and photography, and contemporary artists like Jez Riley French carry on this tradition. Whether visually or sonically, the artists capture moments. Noting the

⁵⁰ Yitzchak Dumiel, “What is Phonography?,” Phonography.org, <http://www.phonography.org/whatis.htm>.

⁵¹ Nathan Moody, "Phonography and Photography," Noise Jockey, <http://www.noisejockey.net/blog/2010/03/25/phonography-and-photography/>.

similarities and merit of each term, it is safe to consider phonography a neologism for field recording; for the purpose of this document they may be used interchangeably.

Thomas Edison's (1847-1931) phonograph, a precursor to commercial audio playback, demonstrated adjustment to our relationship with listening even before the end of the 19th-century. Moving into the 20th-century, Darius Milhaud (1892-1974), Paul Hindemith (1895-1963), and other composers offered composed manipulation of recorded sounds, experimenting with variable-speed phonographs in the 1920s.⁵² Additionally, ethnomusicologists including Hugh Tracey (1903-1977) and Kurosawa Takatomo (1895-1987) utilized field recordings extensively. Modern field recording finds an array of uses, including documentation, research, artistic, and otherwise. The degree to which these recordings are altered varies among artists, with those that fully delve in phonography exhibiting little tangible transformation of the acquired material. Some examples of this will be illustrated later in discussing soundscape composition.

The abundance of musical works incorporating field recordings is immense. Ludwig van Beethoven's (1770-1827) Symphony No. 6 (Pastoral Symphony) (1808) offers woodwind instruments imitating birds. Of course the work contains no field recordings, but sonic characteristics are shared between what the instruments play and birds themselves. Obvious musical restraints yield this as association, not direct presentation of the birds. Feeling orchestral instruments could not properly present the sonic results desired, Ottorino Respighi (1879-1936) incorporated actual recordings of nightingale song to be played in the midst of his tone poem, *The Pines of Rome* (1924).⁵³ We hear actual birds alongside orchestral parts that provide

⁵² Curtis Roads, *The Computer Music Tutorial* (Cambridge: The MIT Press, 1996), 117.

⁵³ John F. Reilly, "Respighi in the Latin Class," in *The Classical World* 53, no. 8 (1960), 249.

association of a natural scene.⁵⁴ Germane to the works analyzed in this document, Pierre Schaeffer's *Étude aux chemins de fer* (1948) presents the use of raw sound material leading to *musique concrète* (i.e., works utilizing microphone-recorded sound versus synthetically generated tones, following a common practice among associated composers as they work directly with sound objects).⁵⁵ Alternatively, one may point attention toward Luc Ferrari's (1929-2005) *Presque Rien No. 1* (1970). As the title references, translating to "almost nothing," the incorporated field recording of a small fishing village underwent extremely little modification. Specifically, he compresses many hours of recordings on a beach to a mere twenty minutes, avoiding any other actions that significantly transform what was initially heard.⁵⁶

Since Ferrari, generations of artists have contributed to an evolving body of works that present largely untreated field recordings. Chris Watson (b. 1952), Jana Winderen (b. 1965), Francisco Lopez (b. 1964), among others, are currently prominent in the field. Their methods vary as much as their theories, offering a plethora of fixed media works and in many cases, installations and other means of presentation. It should be noted that within this document, fixed media will encompass works that aurally deviate only as a result of the equipment and location in which they are played back. While early works (e.g., Schaeffer's *Étude aux chemins de fer*) utilized magnetic tape, and modern day shows countless works that are not a physical item but a sound file (e.g., .aiff, .wav), these pieces are intended to be played from start to finish without substantial alteration to the composition (e.g., no live audio processing).

⁵⁴ Trevor Wishart, *On Sonic Art*, 131.

⁵⁵ Reilly, "Respighi in the Latin Class," 117.

⁵⁶ Trevor Wishart, *On Sonic Art*, 136.

2.3 ACOUSTIC ECOLOGY

In recording technology enabling the use of any sound, the idea of association has been viewed from many angles. In his *Traité des Objets Musicaux*, Schaeffer wrote of the sound-object, disassociating a sound from its source. Extending from Pythagorean lectures behind a curtain, acousmatic music, therefore, presents sounds in consideration for their sonic properties, not their physical, worldly cause (i.e., reduced listening).⁵⁷ Many recognize the natural inclination to pursue associations between a sound and its source. In works like *De Natura Sonorum* (1975, fixed media), composer Bernard Parmegiani (1927-2013) aligns with surrealism, exploring sonic worlds between recognizable and abstract, objects near and far, or the joining of unrelated images to evoke an unreal landscape. Specifically, this can be heard in moving from *Matières induites* to *Ondes croisées* in the work, *De Natura Sonorum*.⁵⁸

Others still, capitalize on a listener's recognition of a sound, integrating other fields to better understand what is recorded. Barry Truax (b. 1947) is a composer known for real-time implementation of granular synthesis, a sound synthesis and sampling technique credited to Curtis Roads (b. 1951) which nods to Iannis Xenakis. Truax is also a founding member of the World Soundscape Project (WSP), a project integral to modern study of acoustic ecology. Working with Truax, Peter Huse (b. 1938), Hildegard Westerkamp, and others, R. Murray Schafer founded WSP in the 1960s at Simon Fraser University, seeking "to find solutions for an ecologically balanced soundscape where the relationship between the human community and its sonic environment is in harmony."⁵⁹

⁵⁷ Trevor Wishart, *On Sonic Art*, 129.

⁵⁸ *Ibid.*, 134.

⁵⁹ Hildegard Westerkamp et al, "World Soundscape Project." The Canadian Encyclopedia, <http://www.thecanadianencyclopedia.com/en/article/world-soundscape-project/>.

Truax wrote of “the mediating relationship of listener to environment through sound.”⁶⁰ It is this study of relationships between environment, sound, and listener, which serves as the foundation of acoustic ecology as established by WSP. Many movements in music focus on a new treatment of musical material and to an extent, this is true of acoustic ecology. Its overt social focus, however, is inherently tied to the subject, expanding discussion beyond compositional tools implemented and their aural result.

As with other disciplines, a merger of related research informs the new. Acoustics, psychoacoustics (i.e., sound perception), otology (i.e., anatomy and diseases of the ear), efforts in noise abatement, sound recording engineering, electroacoustic, and electronic music all serve as informed devices for acoustic ecology. The relationship between humans, the soundscape of his environment, and what happens when those sounds alter, can be better analyzed through unifying these areas of study. This fusion of sciences, sociological issues, and the arts, is what Schafer views as home territory for soundscape studies. One looks to the physical properties of sound, how they are interpreted, as well as how these sounds alter behavior.

To gain a better understanding of the vast areas in which acoustic ecologists research, a number of topics follow. Looking to a broader sense of sociology, for example, acoustic ecology acknowledges the overarching priority over various senses. God was once perceived by many as a sound or vibration, but this was abandoned in the Renaissance, aided in part by the printing press and perspective painting. Additionally, many would argue that *touch* is the most personal of senses. In considering sound propagation, and that humans do not possess “earlids,” hearing can be thought of as touch at a distance.⁶¹

⁶⁰ Barry Truax, *Acoustic Communication* (Westport, CT: Praeger, 2000), 11.

⁶¹ Schafer, *Tuning of the World*, 11.

“Noise” has many definitions and interpretations. Reference to noise among the general public nods to that of the unwanted. Musically, one may initially look to Luigi Russolo’s (1885-1947) argument that prominent noise, as heard in the technological advancements of his time, can be used as music.⁶² George Antheil’s (1900-1959) *Ballet Mécanique* (1926) makes direct use of machines, including player pianos and airplane propellers in the instrumentation, and John Cage later liberated music to be any sounds in and outside the concert hall. The composer of the present day likely feels less restriction as to what sounds can be used in a musical context. To the composer utilizing electronics, noise is a random process of many colors. Analogous to light, white noise possesses equal distribution of energy across the spectrum.⁶³ The colors of noises are employed in audio engineering, physics, and other fields.

Acoustic ecology, however, focuses extensively on noise pollution as a global issue that poses severe threats, including more abundant deafness or meddling with various species’ ability to communicate and, therefore, survive. Noise is seen as what society has learned to ignore, namely sounds overlooked and referenced with negative connotation. This value judgment on sound asks what should be preserved or encouraged versus those sounds that produce negative results. Central to the argument is the dichotomous view of hi-fi and lo-fi soundscapes as defined in acoustic ecology. Hi-fi soundscapes possess favorable signal-to-noise ratio.⁶⁴ This measurement, used in science, engineering, and to describe aspects of a microphone’s abilities, refers in this context to a low level of ambient noise that permits discrete sounds to be heard clearly.

In contrast, lo-fi soundscapes offer occasions where individual sounds are veiled among all else heard. As with white noise, presence is outshined by perspective. Schafer sees

⁶² Luigi Russolo, *The Art of Noises: Futurist Manifesto* (New York: Something Else Press, 1913), 11.

⁶³ Roads, *Computer Music Tutorial*, 1062-3.

⁶⁴ Schafer, *Tuning of the World*, 43.

technology developed within the Industrial Revolution as cause for such soundscapes. Cast-iron rail tramway (1738), boring machines (1774), gas engines (1791), and even food canning (1795)⁶⁵ changed the world not just from their intended benefits, but also aurally. It is also at this point that an aural phenomena initially appears. Previously, one could look to any sound's function over time (i.e., envelope), citing a curved evolution of the sound by means of its attack, decay, sustain, and release.⁶⁶ The Industrial Revolution's "flat line" allows one to hear drones—artificial flat-lines of sound not found in nature. This is mirrored in physical space when looking to roads, bridges, and other manmade items that create lines not found in natural landscapes. Schafer acknowledges that drones in a musical context have served varied functions, not just as an "anti-intellectual narcotic,"⁶⁷ but also as a point of focus for meditation.

Noise pollution and other aural issues are extended by the Electric Revolution. The split between a sound and its reproduction (i.e., schizophonia, as coined by Schafer) acknowledges the modern era's ability to package, store, or counterfeit sounds. Whereas all sounds were at one time originals and could only travel as far as physically possible, they now have independence through technology, which offers amplification and reproduction. This produces a number of social behaviors with which acoustic ecologists have concern. Before the telephone, for example, it would seem unnatural for intimate conversation not to be directly related to the proximity of the person with whom one converses. Additionally, sound is now used for distraction, as in the birth of the Muzak industry. Many consciously carry forth this act by playing music as background on portable devices with poor quality headphones, as seen in daily commutes.

While inspiration may vary from other figures discussed in this document, Winston Churchill (1874-1965) was well aware of noise pollution within the time of World War II. He

⁶⁵ Schafer, *Tuning of the World*, 72.

⁶⁶ Roads, *Computer Music Tutorial*, 97.

⁶⁷ Schafer, *Tuning of the World*, 79.

banned whistling and offered noiseless typewriters in his War Rooms.⁶⁸ More recently, Patrick Shen (b. 1975) directed *In Pursuit of Silence* (2017), a film of interviews with sound and silence-minded experts, interspersed with long static visuals accompanied by their sound. The film highlights an imbalance between noise and silence and the ensuing issues from this.⁶⁹ Most notably, the first four minutes and thirty-three seconds of the documentary are silent.

Extensive electronic use has a sonic presence, even when not within the range of human hearing. Looking to the past, diatonic or modal music offers a fundamental, which dictates a hierarchical relationship. The Indian anāhata offers a central sound against other vibrations that may be measured to seek prime unity. In 239 B.C., the Chinese Bureau of Weights and Measures established the Yellow Bell—a tone from which all others were measured. Now, amid pervasive electronic use, there exists alternating currents. Resonant frequencies of electronic devices, lights, generators, and others are heard throughout cities (and beyond), asking if these continuous sounds (i.e., the aforementioned drones) are thereby the center point of comparison for all other sounds heard.

Acoustic ecology offers additional terms that are of assistance in looking to sound and its social implications. The features of a soundscape, their individuality, profusion, or domination, can help make assessment. The ability to discern foreground, background, or other points of distinction allows a soundscape to be viewed musically and offers sociological information; the terms keynotes, signals, and soundmarks achieve these goals.

⁶⁸ Hannah Furness, “Winston Churchill’s war on noisy typists and whistling revealed in new exhibition,” The Telegraph, <http://www.telegraph.co.uk/news/2016/07/19/winston-churchills-war-on-noisy-typists-and-whistling-revealed-i/>.

⁶⁹ Olivia Parker, “‘In Pursuit of Silence’: The Film That Says We Need More Quiet in Our Lives,” The Telegraph, <http://www.telegraph.co.uk/wellbeing/mood-and-mind/in-pursuit-of-silence-the-film-that-says-we-need-more-quiet-in-o/>.

Much like the musical term that helps identify the key of a composition, keynotes may stray to the subconscious but are imperative. Created by geography and climate (e.g., water, wind, insects), they set the basic ambiance. One may be able to make assumptions of something in F-major, just as they can of standing next to a stream in autumn surrounded by birds and trees. Life without E moving to F at a perfect cadence, or the water continuing to gently trickle, would be noticed. Similarly, Schafer notes as we look to a figure, the ground exists only to give the figure its outline and mass. Without the ground, the figure is shapeless and perhaps nonexistent.⁷⁰

The figure is likely in the foreground; it is deliberately seen. Similarly, signals are any sound heard consciously—one may choose their perception of foreground. Signals are frequently sounds that demand to be heard, perhaps as their initial function is a warning (e.g., bells, whistles, sirens). Borrowing from the term landmark, soundmarks offer something unique to a soundscape. They may be distinct or highly regarded by those who frequent a given area.

In looking to hi-fi and lo-fi soundscapes, acoustic ecologists have collected an agglomeration of information that is of great use to musicians and environmentalists alike. They know the various reasons birds make sounds, as well as how many cycles per second a mosquito beats its wings. They indicate that of anywhere in nature, insects yield the best impression of flat-line sounds. Acoustic ecology offers analysis of the various themes and variations found in the vocalization of humpback whale, noting there may be dialects among different gangs (i.e., herds). While it may be interesting to note that leopards and cheetahs purr, but lions do not, it is important to know the various ways in which this research is employed.

⁷⁰ Schafer, *Tuning of the World*, 9-10.

Direction can be taken in noting the English language minimally reproduces sounds only of animals with which it has had close contact. Knowing a dog is capable of far more than barking, or a wolf howling, a greater understanding, and likely respect, is achieved for an earthling previously thought of as unfamiliar. “The soundscape is far too complex for human speech to duplicate, and so it is in music alone that man finds that true harmony of the inner and outer world.”⁷¹ Respect through familiarization likely alters how one treats and interacts with those who share our planet.

In looking to the numerous roles music has taken in history, Schafer points toward a Dionysian concept. In nodding to Greek mythology we find an irrational, subjective music that employs expression, as seen in Vincenzo Bellini (1801-1835) and Gaetano Donizetti’s (1797-1848) bel canto works of the early 19th-century. Alternatively, the Apollonian model yields a mathematical offering that seeks harmonization of the world through acoustic design. Schafer refers to Arnold Schoenberg’s *5 Pieces*, op. 23,⁷² but one may look to integral serialism or other works that serialize more than pitch, as in Milton Babbitt’s (1916-2011) *Three Compositions for Piano* (1947). Like the Greek god Hermes inventing the lyre after seeing the turtle shell as a resonant body, music emerges from technology and the discovery of acoustic properties. Research by Schafer and colleagues reaffirms music as a search for harmonizing influence of sounds in the world around us.⁷³

More precisely, soundscape recordings offer concrete evidence of change to an ecosystem. Through those involved in WSP, as well as figures like Krause, many fight for the preservation of natural hi-fi soundscapes, limit of noise pollution, public education of related topics, and other efforts that discover our relationship with the Earth through sound.

⁷¹ Schafer, *Tuning of the World*, 42.

⁷² *Ibid.*, 6.

⁷³ *Ibid.*

2.4 SOUNDSCAPE COMPOSITION

Born from the pedagogical intent of WSP, soundscape compositions are electroacoustic, fixed media works that share a set of characteristics and values. Coined by Barry Truax in 1969, the initial impetus for soundscape composition produced works that not only exhibit recognizable environmental sounds and contexts, but also have a strong objective to invoke listeners' associations, memories, and imagination to a given soundscape.

At their genesis, soundscape compositions were both educational and archival, but a distinct aesthetic of electroacoustic music was born from their actions. Acoustic ecologists wished to use recorded environments as a catalyst for embracing soundscape in one's community. Recording environmental sound and placing it out of its original context was initially accompanied by minimal alteration transparent to the listener. They stayed on the neutral, versus abstract, end of a continuum where recordings are closest to their original environment. This contrasted with works like Schaeffer's *Étude aux chemins de fer*, which could be viewed as an abstract sound collage that uses sounds from the environment as raw material. Conversely, Truax notes this untouched treatment of field recordings may be called "found composition."⁷⁴ However, this is not presented as a widely used definitive nomenclature, nor does it encompass all of what will ultimately be presented in this document's use of the term.

There are numerous conventions one may trace in soundscape composition, as the mere inclusion of environmental sounds does not validate the incorporation of a term now used liberally. Works for acoustic instruments, or sound installations may address the issues that follow, soundscape compositions are fixed media works. Composers have explored the range between found sound and what is slightly more abstract. An early example like Truax's *The*

⁷⁴ Barry Truax, "Soundscape Composition," Barry Truax, <https://www.sfu.ca/~truax/scomp.html>.

Vancouver Soundscape (1973) was contained on two vinyl records accompanied by a booklet. A subsequent release in 1996 offered additional recordings to compare what had changed in the observed environment over decades. In contrast, Truax's *Riverrun* (1986) is entirely real-time granular synthesis, but still exudes a strong environmental character. Early works within the genre not only utilize relatively untransformed, alluring, representative recordings of an environment, but also place great emphasis on obtaining high recording quality. These ideas, however, did evolve.

Truax's *Summer Solstice* (1974) allows two-minute excerpts of field recordings to represent an hour, creating a daylong documentation of a natural soundscape. Westerkamp's *Kits Beach Soundwalk* (1989), as well as works by Annea Lockwood (b. 1939), Bernie Krause (b. 1938), Claude Schryer (b. 1959), and others, present radiophonic works where voice and sound are closely linked. These are a natural extension of soundwalking (i.e., an excursion with the intent of listening to the environment)⁷⁵ where the artist verbally guides us through a space. In *Kits Beach Soundwalk*, one listens, gradually leaving city sounds behind in favor of tiny, often ignored sounds (i.e., barnacles). The journey is guided throughout by the sound of the composer's voice. Fixed, moving, or variable perspectives are explored in such works.

All, however, offer recognizable source material that provokes a listener's illusory correlations to gain understanding of the presented environment. "The soundscape composition is the journey that circumscribes the relationship, the conversation between composer and sound sources."⁷⁶ Westerkamp notes that it is not just the composer's intent that helps define soundscape composition, but also "the power of the sound materials themselves to shift that

⁷⁵ Hildegard Westerkamp, "Soundwalking," *Sound Heritage III* (1974): 25.

⁷⁶ Hildegard Westerkamp, "Linking Soundscape Composition and Acoustic Ecology," *Organised Sound* 7 (2002): 53.

intent by virtue of their inherent meanings, as well as through discovery and surprise in the compositional process."⁷⁷ This nods to what the composer discovers, not just the audience.

2.5 SONIFICATION

While some composers have presented work that strives to offer an aural experience not unlike the original incorporated environment, others present what cannot be heard. The remapping of complex data systems from one medium to another points toward sonification.⁷⁸ It is a means of representing data with sound, offering a nonspeech sonic experience that permits information to become more comprehensible.⁷⁹ It can be thought of as the aural counterpart of visualizing data, taking advantage of “the aural perception of patterns, which may not be apparent in a purely visual approach.”⁸⁰ One may “listen” to the stock market by assigning pitches and rhythms to various aspects of the collected data to hear fluctuation over a given period of time. Alternatively, seismological data from an hour may be used to develop a musical gesture played over a minute.

Using data which was not initially related to any aural expression can be seen among a variety of composers. Charles Dodge’s (b. 1942) appropriately titled, *Earth’s Magnetic Field* (1970) is derived from the average magnetic activity on Earth. “The musical interpretation consists of setting up a correlation between the level of the K_p reading and the pitch of the note (in a diatonic collection over four octaves), and compressing the 2,920 readings for the year into

⁷⁷ Westerkamp, “Linking Soundscape Composition and Acoustic Ecology,” 53.

⁷⁸ Gregory Kramer et al, “Sonification Report: Status of the Field and Research Agenda,” International Community for Auditory Display (ICAD-10), <http://www.icad.org/websiteV2.0/References/nsf.html>.

⁷⁹ Bruce N. Walker and Michael A. Nees, “Theory of Sonification,” in *The Sonification Handbook*, ed. Thomas Hermann et al (Berlin: Logos Publishing House, 2011), 9.

⁸⁰ Barry Truax, “Sound, Listening and Place: The aesthetic dilemma,” *Organised Sound* 17 (2012): 195.

just over eight minutes of musical time."⁸¹ While Dodge actively decided pitch material and other ways in which the data would be sonically represented, a great deal of how the music unfolds is determined by the data, not the composer.

Matthew Burtner's *Song for Low Tree* (2011, percussion and electronics) asks the performer to communicate with a tree, "reaching deep to hear it, playing to it."⁸² Tree respiration data determines the musical material and how the piece unfolds. In *Iceprints* (2010, one to three telematic pianos and Arctic sub-ice ecoacoustics) we hear 40-years of polar ice change in the Arctic Ocean. The four-decades of time are assigned by pages of music; each page of the score represents a year of ice extent (i.e., the sum total of ice) data. The sum presence of ice measured is mapped onto the first six octaves of the piano. These parameters help one hear an overarching musical gesture. Accompanied by the background of the piece, a strong melting trend may be observed. The level of aural sensitivity varies among those working with sonification. Regardless, sonification allows one to likely hear the impossible—decades are reduced to minutes, numbers are brought to life, music is used in service of science.

2.6 ECOACOUSTICS

The aforementioned items affirm environmental issues, such as biodiversity loss and climate change, as germane to many composers' work. They are worldly topics not only acknowledged in related sciences, but also by world leaders and public servants with the power to generate meaningful change. As with countless individuals that came before, an expression of these social issues can be found in the art of today, as presented by composers and sound artists whose environmentally conscious mindset is reflected in their work. It may be too soon to offer

⁸¹ Charles Dodge, liner notes to *Earth's Magnetic Field*, Nonesuch LP H-71250, 1970.

⁸² Matthew Burtner, "Song for Low Tree," Matthew Burtner, <http://matthewburtner.com/song-for-low-tree/>.

an established term to describe a number of like-minded individuals, but composers David Monacchi, Matthew Burtner, and others, use ecoacoustics to describe their work.⁸³ Ecoacoustics may be viewed as remapping abstracted environmental processes into forms that can be scored in sound, allowing one to hear the world as music.⁸⁴ A number of other traits, however, can be cited in this music.

Since the birth of *musique concrète*, technology has allowed for direct application of natural sounds. Also looking to the sonic material of electroacoustic music, soundscape composition, and others, the use of sounds from nature is prevalent and widely accepted. Merging elements of the preceding musical concepts, ecoacoustics offers a contemporary set of principles that guide numerous composers. Monacchi sees his work as “a place where technology and science meet music and art to address environmental issues.”⁸⁵ He aims to offer music that yields an enhanced listening experience, highlighting the beauty and phenomena of natural sound. This is exemplified in his Greenpeace International sponsored work, *Fragments of Extinction*. The extended-year sound art project involved extensive field recording in the Amazon (2002), Africa (2008), Borneo (2010, 2012), and Ecuador (2014), presenting Earth’s most complex and fragile ecosystems, which exhibit an extremely high rate of extinction. Half of the planet’s original species, many of which are currently unknown, will be extinct by the end of the century. Monacchi’s goal is to raise public awareness, nodding to environmental heritage and the serious issues that surround loss of tropical forests and endangered species. Obtaining

⁸³ N.B. Monacchi utilizes a hyphen, describing his music as eco-acoustic music.

⁸⁴ Matthew Burtner, “The Syntax of Snow: Musical Ecoacoustics of a Changing Arctic,” in *North by 2020: Perspectives on a Changing North*, ed. Maya Salganek and Hajo Eicken (Fairbanks: University of Alaska Press, 2011), 651-678.

⁸⁵ Jonathan Gilmurray, “Ecoacoustics: Ecology and Environmentalism in Contemporary Music and Sound Art,” academia.edu, http://www.academia.edu/2701185/ECOACOUSTICS_Ecology_and_Environmentalism_in_Contemporary_Music_and_Sound_Art.

soundscapes perhaps previously unheard by humans, the work aurally focuses upon our “sixth mass extinction” with a cross-disciplinary, multi-purpose approach of scientific research, technological innovation, environmental communication and education, and sound art, showcased through an ecoacoustic composition with 360° sonogram visualizations.⁸⁶

This exemplifies much of Monacchi’s work, which follows his model for ecoacoustics. Monacchi delves into intense listening in the recording location. This is followed by analysis of the recording to maintain the essence of the original environment, only employing audio processing that emphasizes the natural musicality of the soundscape. The exception lies in adding what he calls “horizon harmonics” (i.e., electronically created drones tuned to the harmonic series to provide harmonic foundation). Many of his works are presented in multichannel along with projections of the sonogram analysis scrolling in real time. The latter could be thought of as a musical score or a geographical map, both promoting a more personal connection with what is presented aurally. Monacchi will frequently perform with a transverse wooden flute or hand sensors to control electronics, offering material that is available temporally and within available frequencies. As seen across numerous species, he does not intrude in others’ space but rather, finds his own. Unlike the untouched, quintessential representation found in soundscape composition, Monacchi acknowledges humans are one part of a complex ecosystem. “As we treat the world, so we treat ourselves.”⁸⁷

Ecoacoustic composer Matthew Burtner, a focus in chapter four of this document, exhibits similarities to aforementioned practices in a paradigm of using ecoacoustic instruments, sonification, and interactivity. His work, *The Syntax of Snow* (2011), is scored for glockenspiels

⁸⁶ David Monnachi, “Fragments of Extinction,” *Fragments of Extinction*, <http://www.fragmentsofextinction.org/fragments-of-extinction/>.

⁸⁷ John Luther Adams, *Winter Music: Composing the North* (Middletown, CT: Wesleyan University Press, 2004), 128.

and amplified snow. *Windprints* (2005/2010) uses data from analysis of wind blowing across the arctic tundra to determine harmony, meter, and dynamics. The wind virtually blows through the ensemble performing. In a portion of Burtner's multimedia opera *Kuik*, dancers perform with a cone-shaped sculpture (i.e., *Windtree*) that has sensors tracking their movement to control a computer-generated physical model of wind in real time. *Auksalaq* (2012), his telematic opera (i.e., performed simultaneously by multiple ensembles in different geographic locations across audio-video streaming) provides additional examples. This includes "NOMADS" (Network-Operational Mobile Applied Digital Systems) in which the audience directly influences items such as libretto, music, and video display.⁸⁸

While Monacchi and Burtner exhibit a range of techniques in their work, there are similarities that point toward common trends of ecoacoustics. Each offers work not just inspired by, but permeated with concern for fragile environments. The pieces enable human performers to interact within an environmental system, offering a musical, symbiotic relationship with the employed environment. Looking to their breadth of work, one can anticipate ecoacoustics to offer art focused on human interaction within an ecosystem through sound, utilizing soundscape composition, sonification, and interactive technology. It offers musical metaphors that highlight characteristics of nature and how man may interact within said environment. In considering other composers, including John Luther Adams, Leah Barclay, Walter Branchi, David Dunn, Andrea Polli, and Douglas Quin, these points are strengthened, defining ecoacoustics as a useable term referencing a thriving new musical endeavor.⁸⁹

⁸⁸ Matthew Burtner, "Ecoacoustics," Matthew Burtner, <http://matthewburtner.com/ecoacoustics/>.

⁸⁹ Gilmurray, "Ecoacoustics."

2.7 FOUND COMPOSITION

Moving forward, the work of select composers will be analyzed, each exhibiting some of the aforementioned terms. Emphasis, however, will be placed on what determines the aural outcome of a work: the composer or the incorporated environment. In doing so, the author intends to define found composition. Through field recording, acoustic ecology, soundscape composition, sonification, and ecoacoustics, they present musical ideas that in turn viably define and cultivate a future for the topic at hand.

CHAPTER THREE. HILDEGARD WESTERKAMP

3.1 BIOGRAPHY

“An openness to all possibilities. No attempt to control anything or anybody. A sparkle in his eyes. Offering a space to relax into. A freedom. An inner space that feels authentic.”⁹⁰

—Westerkamp on John Cage

In looking to specific bodies of work that relate to this document’s focus, one inevitably may cite the musical output of composer, radio artist, and educator Hildegard Westerkamp (b. 1946). She is influenced and in some cases has worked with the likes of John Cage, Pauline Oliveros, and Barry Truax. Oliveros’ sonic meditations even found presence in Westerkamp’s teaching, having discovered students had greater success with technology after learning to equalize and filter sounds with their own bodies.⁹¹

Originally from Osnabrück, Germany, she studied flute and piano at the Conservatory of Music in Freiburg, later obtaining degrees from the University of British Columbia and Simon Fraser University (SFU). The latter two institutions were the genesis of a long tenure in Canada, which included teaching acoustic communication at SFU (1982-1991) and extensive work as a composer.⁹² Preceding her formal training, however, she had interest in the sound effects heard in 1950s and 1960s German Hörspiel (i.e., radio dramas). Today, many of Westerkamp’s fixed media works are prominent standards, seen as an imperative part of study in soundscape composition and field recording.

⁹⁰ Hildegard Westerkamp, “Thinking of John Cage,” *The Soundscape Newsletter* 4 (1992), 3.

⁹¹ Andra McCartney, *Sounding Places: Situated Conversations through the Soundscape Compositions of Hildegard Westerkamp* (Toronto: York University, 1999), 140.

⁹² Kevin Bazzana, “Hildegard Westerkamp,” *The Canadian Encyclopedia*, <http://www.thecanadianencyclopedia.ca/en/article/hildegard-westerkamp-emc/>.

Having initially served as a research associate alongside R. Murray Schafer at the World Soundscape Project at SFU from 1973-1980, Westerkamp has for decades been an integral part of soundscape composition. She was enamored by listening to the world's musical potential in environmental sound, and this expanded her listening beyond what traditional classical music training offered. It was WSP, the birthplace of acoustic ecology, that led her to composing, not necessarily her earlier musical training. Schafer opened her to the potential of becoming a composer, and her presence undoubtedly influenced important texts, such as his *The Tuning of the World*. It was in this time that she worked with the Vancouver Cooperative Radio (CFRO), leading to experimentation with recording and mixing environmental sounds and growing concern for noise and the soundscape. Truax taught her many of the classic tape studio techniques and was highly encouraging of her continuation based on the quality of her initial work. Radio yielded opportunity to experiment, akin to Pierre Schaeffer and Pierre Henry (1927-2017) at Radiodiffusion Française, and ultimately Groupe de Recherche de Musique Concrète. Her experimentation was supplemented by many other projects, including research with the Noise Abatement Project of the Society Promoting Environmental Conservation in Vancouver, as a researcher for the Women in Music project at SFU, and as a founding member of the World Forum on Acoustic Ecology (WFAE) in 1993. The latter is an international consortium of organizations exploring social, cultural, and ecological efforts that reflect concern for the world's soundscapes.⁹³ Alongside editorial efforts with WFAE, she has also worked with *The Soundscape Newsletter* and *Soundscape: The Journal of Acoustic Ecology*. Her writing serves as an invaluable resource within acoustic ecology and related areas. These efforts reflect a deep

⁹³ "About," World Forum for Acoustic Ecology, <http://wfae.net/about.html>.

commitment to the values of acoustic ecology expressed in previous chapters. “Her ears [are] drawn to the acoustic environment as another cultural context or place for intense listening.”⁹⁴

It is notable that many of her compositions precede terms that are now commonplace to describing work like hers and her colleagues. With their efforts in the emergence of ecological concern, alongside technological advancement, many of the musical trends imperative to this document were born.

3.2 COMPOSITIONAL PROCESS AND AESTHETICS

Like many of her colleagues, including Schafer, Truax, Bruce Davis, and Peter Huse, the bulk of Westerkamp’s output is for tape (i.e., fixed media), emphasizing largely untouched recordings from acoustic environments. She frequently uses urban and rural soundscapes, but has also incorporated human voice(s) that explore varying cultures, or poetry by Norbert Ruebsaat or herself, as in the works, *A Walk through the City* or *Cricket Voice*. The deeply personal *Für Dich/For You* and *Liebes-Lied/Love Song* revolve around the poetry of Rainer Maria Rilke (1875-1926), fused with sonic sounds dear to the composer.

Her inimitable work, *Kits Beach Soundwalk* (1989, fixed media), a product of her time at CFRO, is directly related to soundwalking. Listeners are guided by Westerkamp’s voice, drawing attention to fading city sounds in favor of barnacles. We hear the composer’s voice swaying our attention from one sound to another, exaggerating high, small, hidden sounds that may have gone otherwise unnoticed. She virtually points our now enhanced ears to places typically obscured by city sounds. We gain perspective on acoustic environments that initially seem familiar.

⁹⁴ Hildegard Westerkamp, “Biographical Details,” Hildegard Westerkamp - Composer, <https://www.sfu.ca/~westerka/bio.html>.

A number of facets of Westerkamp's output should not be taken for granted when discussing her work. Frequently working in a medium without live performer, for example, enhances efforts in drawing attention to sounds of the planet. Just as some prefer delivery of a story by book versus movie, working in this medium can heighten visual responses; what is visualized, however, actually exists.

Another notable feature in her work and that of others involved in acoustic ecology and soundscape composition is the limitation of audio processing. Composers may sculpt a recording, altering sounds so that even their essence is barely audible. The further one moves in history, technology affords new and easier means of transforming a sound. For example, the sound of the tiny moment a ping pong ball first strikes a table can become an incredibly lengthy, low sonority that glisses downward in pitch as it passes one's ears. Westerkamp's work is not absent of processing, but what is employed is either minimal or quite often leaves one believing they are hearing what originally occurred. If the sound initially recorded is familiar to the listener, it can likely be identified within the work.

This use of relatively untouched or recognizable field recordings is most notable in that it is in principle giving up compositional decisions. For instance, a composer may dictate as little as possible, asking only for a D-natural to be played on the clarinet for four beats. This works within an established system; it is a settled form of communication between composer and performer, present even in the Baroque era where, in contrast to more recent New Complexity scores, much is implied or left to the performer. Composers indeed leave decisions to performers in this context. The clarinetist can alter the amplitude of the D-natural, make decisions about its attack and decay, or offer subtle color changes through timbral modification. Even here,

however, the composer has given more voice to what will be, compared to leaving musical decisions quite literally to the birds.

Westerkamp's compositions, writing, organizations, workshops, and other efforts, clearly reflect social change that is cognizant of environmental awareness. Her first work, *Whisper Study*, is based on the Kirpal Singh (1894-1974) phrase, "When there is no sound hearing is most alert," pushing listeners to contemplate the sentence, its meaning, and silence. She notes hypothetically if she were to write for acoustic instruments alone, compositions may look initially to words before addressing what the instruments may do. (More direct examples exist, such as her work, *A Walk through the City*, which utilizes voices and soundscapes to point toward social concerns in downtown Vancouver. Subsequent works often focus on a theme or specific place.) Having not composed before World Soundscape Project, Westerkamp desired to have a creative outlet related to her environmental findings.

It is significant that Westerkamp does not see listeners consciously perceiving connection to the original source and the final composition as an imperative matter. The tired argument of audience perception and illusory correlations is not lost on most composers. Despite the use of sounds that are often from a specific place and have an environmental focus, Westerkamp cultivates connections based on intuition, "sensing how the original sounds inherently belong to any given place."⁹⁵ This pushes for inquisitive listening over increased awareness of issues in an environment. Program notes highlight connections between the piece and the source, but one can simply listen and their existent experiences likely result in a common, rarefied interpretation.

As established, Westerkamp feels music can activate an awareness of sound, which allows listeners to construct a great care for their environment. It enhances one's experience with

⁹⁵ Hildegard Westerkamp, an interview by Cory Kasprzyk, February 2014.

a particular place. In the 1930s, the philosopher Walter Benjamin (1892-1940) discussed the *Erlebnis* and the *Erfahrung* (i.e., *lived* versus *genuine* experience). One may consider technological advancement, which aids in circulating information. This usefulness (i.e., *Erlebnis*, a reaction to the ephemeral), can be at the expense of *Erfahrung* (i.e., losing potential for a collective and continuous memory). Benjamin saw the loss of experience as a necessary condition to building a new world (i.e., constructing one's self from nothing), but this does not consider values (i.e., that which may be inexperienceable). Conversely, he felt that lived experience (i.e., *Erlebnis*) can prevent spontaneity.⁹⁶

Similarly, musicologists Frédéric Duhautpas and Makis Solomos have written that Westerkamp's compositions allow the listeners to move freely, but this is not without noticing her presence. Many works, for example, make reference to her personal life, particularly those with her own voice or with sounds from locations where she's lived.⁹⁷ This all nods to an additional layer of consideration when pondering the degree to which her compositional authority and a field recording's autonomy is inadvertently present. One may argue that in many cases, what one chooses to record already imposes a personal mark on the material itself. As discussed in previous chapters, an awareness of one's experience as the recorder, and if these experiences are shared or conveyed with the listener, must to a degree be accepted. Westerkamp seeks to record and work with those sounds which speak most powerfully of a place.

It is this relationship between the original recordings and the final work that informs her compositional process. These aural excursions may not be unlike traveling through the respective physical place. Both the act of recording, then working with the musical material, contributes to

⁹⁶ Peter Osborne and Matthew Charles, "Walter Benjamin," *The Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), <https://plato.stanford.edu/entries/benjamin/#EarWorKanExp>.

⁹⁷ Frédéric Duhautpas and Makis Solomos, "Hildegard Westerkamp and the Ecology of Sound as Experience. Notes on Beneath the Forest Floor," *Soundscape: The Journal of Acoustic Ecology* 13, no. 1 (2013-14), 6-9.

additional discovery that aligns with values expressed in acoustic ecology. Unlike the aforementioned clarinet, the environmental sounds one may utilize can carry meaning, akin to the manner in which words do. Listening to Westerkamp's work is in some ways listening to her converse with the employed sounds, each of which have a message with which she interacts. This is particularly critical to this document, in that the conversation she has with the sounds implies ceded action. She could alter the sounds more significantly or dictate far more about their presentation, but her intimate experiences with them and their respective origin yields a respect for retention—the sounds dictate the musical path more than in many other musics.

One may initially think of Cageian influence with the preceding, but letting an observed environment dictate a musical path is in this case far more than a removal of “self.” By letting the meaningful voice of an environment speak, one which may or may not be comprised of sentient beings or other life, the sounds inevitably inform the composer. Indeed the “self” is removed altogether in that the embedded conversation between meanings found within the field recordings and the composer's voice is a crucial essence of soundscape composition.⁹⁸

3.3 ANALYSIS OF WESTERKAMP'S *BENEATH THE FOREST FLOOR*

Beneath the Forest Floor (1996, fixed media) remains one of Westerkamp's more well known pieces, and like *Kit's Beach Soundwalk*, is exemplary of her work as well as this chapter's focus. In moving forward, it is worthy to ask what one hears, its presentation, and most importantly, Westerkamp's role in a given musical moment being a part of the piece.

Though written after the work's completion, the program notes for *Beneath the Forest Floor*, as in her other works, encourage contemplation, enhancing how the sounds may provoke

⁹⁸ Hildegard Westerkamp, an interview by Cory Kasprzyk, February 2014.

one's imagination and enthusiasm for a space. While somewhat a description of the composer's excursions both within the space and while composing the respective piece, they encourage a great understanding of a physical space's value. We gain a more intimate view of the place by reading the composer's account of her experience within the forest.

Figure 3.1: Program Notes for *Beneath the Forest Floor*.

Beneath the Forest Floor is composed exclusively from sounds recorded in old-growth forests on British Columbia's westcoast. The piece attempts to reach beyond the visible forest, into its' shadow world, its' spirit; into that which effects our body, heart and mind when we experience forest.

Most of the sounds for this composition were recorded in one specific location, the Carmanah Valley on Vancouver Island. This old-growth rainforest contains some of the tallest known Sitka spruce in the world and cedar trees that are well over one thousand years old. Its' stillness is enormous, punctuated only occasionally by the sounds of small songbirds, ravens and jays, squirrels, flies and mosquitoes. Although the Carmanah Creek is a constant acoustic presence it never disturbs the peace. Its' sound moves in and out of the forest silence as the trail meanders in and out of clearings near the creek. A few days in the Carmanah creates deep inner peace—transmitted, surely, by the trees who have been standing in the same place for hundreds of years.

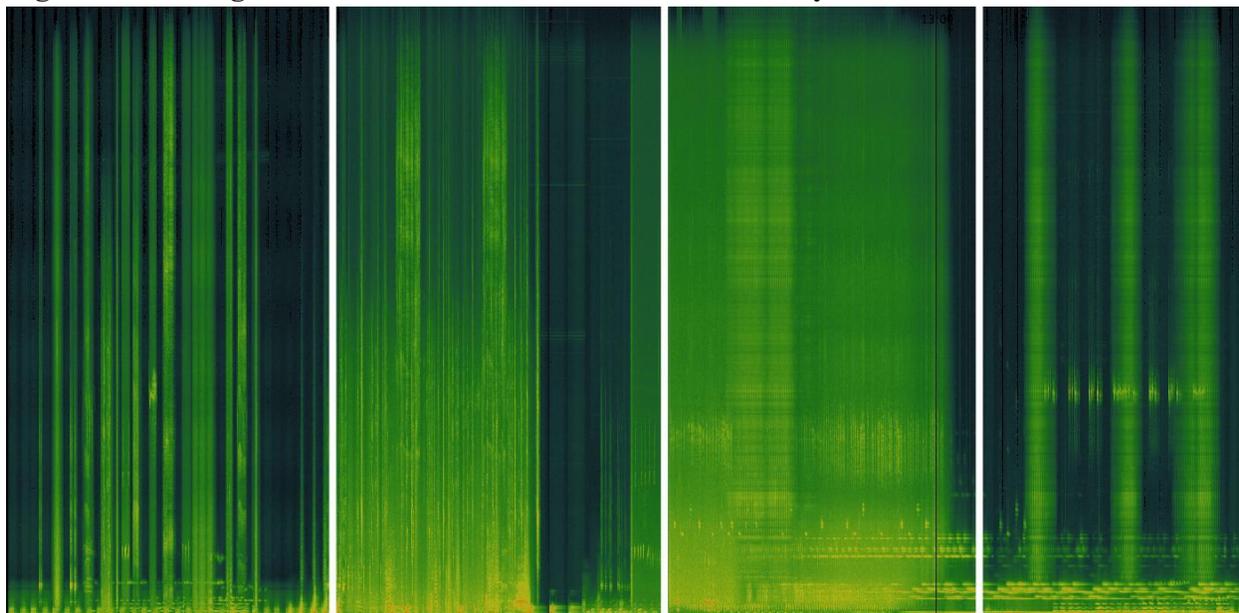
Beneath the Forest Floor is attempting to provide a space in time for the experience of such peace. Better still, it hopes to encourage listeners to visit a place like the Carmanah, half of which has already been destroyed by clear-cut logging. Aside from experiencing its huge stillness, a visit will also transmit a very real knowledge of what is lost if these forests disappear: not only the trees but also an inner space that they transmit to us: a sense of balance and focus, of new energy and life. The inner forest, the forest in us.

Beneath the Forest Floor was commissioned by CBC Radio for Two New Hours and was produced in CBC's Advanced Audio Production Facility in Toronto with the technical assistance of Joanne Anka and Rod Crocker. Thanks to Norbert Ruebsaat for providing his recordings of an adult raven and a young raven from the Queen Charlotte Islands. All other recordings were made by myself mostly in the Carmanah Valley on Vancouver Island, as well as in forests near Cowichan Lake on Vancouver Island, on Galiano Island and in Lighthouse Park near Vancouver. All sounds were recorded throughout the summer of 1991. Thanks to Peter Grant for assisting in much of the recording process. Special thanks go to

David Jaeger, producer of *Two New Hours* for making this possible and for giving me the opportunity to work in the above-mentioned all-digital facility at CBC Radio, Toronto.⁹⁹

In the piece, Westerkamp uses long unaltered field recordings, as well as brief sound objects that are processed into less recognizable musical entities. Density plays an important role in the work's overall form as she explores how much of the incorporated material is layered. There are four sections, utilizing the entire spectrum as seen in Figure 3.2, separated by occasional moments restricted to primarily low sounds. Having this formal structure is indicative of a compositional decision, but this is in part, a global outcome evolved from the aforementioned conversation with the recordings themselves.

Figure 3.2: Sonogram of *Beneath the Forest Floor* divided by sections.¹⁰⁰



Of the limited processing employed in the work, sounds are time stretched, looped, panned, filtered, or put through reverberation. Much of what is heard is not a far cry from the

⁹⁹ Hildegard Westerkamp, an interview by Cory Kasprzyk, February 2014.

¹⁰⁰ Sonogram created by Kasprzyk.

original recordings obtained by Westerkamp in the old-growth forests. She offers the forest's unchanged and recognizable environment, at times enhancing its acoustic depth through the aforementioned audio processing. Birds extend to become chords or fly by one's aural image, but we essentially hear Carmanah Valley.

Of particular note is the first sound heard: a substantially slowed-down, rhythmic raven call that rumbles and prevails throughout. Within the first section, the sound begins every eight to ten seconds upon each occasion. The other sounds heard in this section frequently appear within the decay of the slowed-raven's sound, but this does not occur consistently (i.e., they sometimes coincide). The "drumbeat," as Westerkamp refers to the slow raven call, prevails throughout the work—not an *idée fixe*, but a sonic symbol of coexistence with nature. Upon working with the sound, Westerkamp discovered that its altered timbre is reminiscent of the native Indian drum found in the west coast of British Columbia. The raven itself is also a common totem animal in many tribes from this region, and the poles are made from the trees in many similar forests. The deep raven that beats through the work can for some represent cultural activities within forest life of these native Indians.¹⁰¹ As always, the alteration of the recording was achieved through conversation with the sounds, as Westerkamp describes.

I do feel that sounds have their own integrity and feel that they need to be treated with a great deal of care. Why would I slow down [a] cricket's voice but not my daughter's? If the cricket had come from my own garden, had a name and would talk to me every day, would I still be able to slow it down? [...] I tried to make [the raven] into a regularly beating drum...it simply wouldn't let me. So I returned to the shape of the original full call, slowed that down and received from it a drum-like sound.¹⁰²

In some ways, the drumbeat is one of the most dramatically altered processes employed in the work, and it is by comparison quite minimal. Jonty Harrison's (b. 1952) *...et ainsi de*

¹⁰¹ Hildegard Westerkamp, an interview by Cory Kasprzyk, February 2014.

¹⁰² McCartney, *Sounding Places*, 141.

suite..., composed in the same year, utilizes a vast variety of sounds derived in part from wine glasses. This and other works in the *musique concrète* tradition exhibit substantially more processes that alter source material significantly. This is not to cite techniques used as a sign of increased value, but rather to draw distinct aesthetic differences. In most cases, one can guess the original source material used in Westerkamp's work, and this retaining of identity is imperative to her output.

Looking to each of the four sections, one may note both Westerkamp's compositional presence and the retention of what was originally recorded. While there is not always a distinct point of transition from one to the next, each section exhibits a unique exploration of sonic interaction. The first section provides an introduction to the forest's inhabitants. For three minutes and forty-four seconds, we hear interjections between each drumbeat, including the raven in its original form, as well as squirrels, creeks, thrush, jays, and others. In hearing their voices, we also hear their natural habitat. While some composers may strive to sample a bird sound, excluding all other sounds that provide context, *Forest Floor* yields a direct glimpse into, for example, where the squirrel lives. Interspersed with the drumbeat, one hears the unique and untouched soundscape of each presented sound.

It is worthwhile to immediately take into account what elements can or cannot be directly attributed to the composer. The percentage of time stretch applied to the raven was decided by Westerkamp, but the bird's caw was beyond her control. Of course, any of the beings heard are beyond her control, and it is likely she would not stealthily remove some of a squirrel's barks. It is her decision, however, to alternate between the drumbeat and other sounds—a microscopic rondo—after presenting the drumbeat three times to begin the work.

Within the first section, Westerkamp also foreshadows the end of the piece by offering chords that are derived from time-stretched recordings of songbirds. One could argue this is a tangible decision about the work's formal structure made by the composer, or see it as reflective of the blur that exists within nature. While acoustic ecology demonstrates species have their respective space, both temporarily and in terms of frequency, life does not offer songbirds in traditional, musical sections.

After three and a half minutes, preparation for the second section of the piece is achieved through a thinning texture. Westerkamp describes the next portion as “the dark side of the forest [. . .] a mythical place full of powerful natural forces and potential dangers.”¹⁰³ We hear just the drumbeat, this time with slightly more space in between each iteration. We hear trees creaking in a storm alongside other animal sounds slowed down, juxtaposed with the first appearance of a chainsaw (i.e., at approximately 3:53, at first presented with low frequencies, moving toward a more recognizable sound with each occurrence). This is perhaps the most overt dichotomy presented in the work; one clearly hears man versus nature, old versus new, or life versus destruction.

At 4:39, another tree squeak facilitates transition into a new texture—one that pulls the listener into a true forest soundscape—with few exceptions that provide indication of it being something other than a field recording. This is negated at 4:57 by the first of numerous quickly panned sounds, moving toward the hyperreal with an exaggerated gesture of something flying in front of the listener. (At other points in the work, that which flies by one's stereo image is water, truly pulling attention away from an overall soundscape that could be perceived as *real*.) In the same moment, wind helps this transformation as the entire spectrum is now used. This section

¹⁰³ Hildegard Westerkamp, an interview by Cory Kasprzyk, February 2014.

also serves as contrast from the previous, offering a more continuous texture instead of frequently moving from one musical idea to another. As it progresses, however, there is alternation in the foreground between natural sounds and the chainsaw itself.

Voices are continually added to increase density. One may notice glissandi from a variety of sounds, including the trees. As the section concludes, the chainsaw is subjected to the same treatment, most notably at 7:13. The large gliss downward leads to an extended resonance and all voices ceasing, with the exception of one last quick pan articulated at 7:25. All is nearly silent by ten seconds later, and the work returns to single sounds that are typically within the lower portion of the spectrum, now more sustained.

The next minute of the work is quite sparse, clearly offering a number of decisions made by the composer. While instances of the drumbeat occur, alongside some sporadic birds, the listener hears two voices with tangible pitch: whole-step glisses upward, a perfect fifth apart from each other. (The gesture initially moves upward to E-flat and B-flat.)

Aside from this introduction to discernable pitch, the composer cleverly crafts a few gestures that work with the listener's anticipation. These events must be decisions made by the composer. Moving into 8:44, water trickles into one's aural image, slightly slower than in previous occasions. This serves once again to introduce use of the entire spectrum, giving the impression that we truly have moved into a new texture. Distant wind fills the top of the spectrum as previous voices continue. At 9:11, however, two voices quickly move in opposing direction, jarring from the otherwise static passage. As though opening a soundproof door, a third and final quick pan of water introduces what is truly the new texture at 9:15.

The work's third section is an immediately dense, watery texture that explores the rhythms of looped samples. Sparse sections of the piece exhibit nothing above 1000 Hz. While

the primary energy of this section is initially between 400-900 Hz, the full spectrum is used, offering an extremely refreshing contrast. As though leaning one's ear right next to a rushing creek, we hear tiny water melodies and rhythms that Westerkamp loops for multiple occasions of listening. Songbirds sing single pitches, as though introducing the individual notes of a chord that all will sing later. Their voices are eventually extended, losing their immediate identity as bird song, to become sustained pitches that fill the top of the spectrum. A faint arpeggiated G-flat major chord creeps in before 10:00. Westerkamp smoothly moves from texture to texture, offering varying loops of running water and low glissandi, moving a larger body of rushing water in and out of focus. By 12:00, one may clearly hear highly organized material, not patterns that occur naturally. That shorter recordings are repeated is clear; these fragments allow one to potentially meditate within what is aurally offered.

One may hesitate based on the familiarity of the sounds, but it is the aforementioned organization that draws interpretation of this section as being crafted by a human. In considering the use of time-stretched recordings, as well as the short passages looped repeatedly, this section exhibits the largest fingerprint from the composer. Westerkamp continues into the next section, where after more than thirteen-minutes into the work, one is left with seemingly distant, unearthly sustained chords. A lone, familiar drumbeat of the raven appears at 13:40, clearly heard as the lowest voice present.

The final portion of the work is perhaps the most abstracted from that of the forest's soundscape. The upward glissandi and high chords of slowed-down songbirds create a soundscape of their own. The sound of the forest is now a memory, only provoked by occasional water loops and a tiny bird "peep." The latter is consistently heard in the foreground when present, offering another fabricated world of altered proportions, where the tiniest voice from a

tiny being, shines above all. The drumbeat of the raven is heard three final times as all material fades.

A number of thoughts can be drawn from looking to what has been highlighted thus far. Westerkamp's compositional authority is present in many ways. An overall form to the work can be assessed, particularly in considering variation in density. Instances of tangible harmony exist, pulling us from the forest soundscape. Conversely, it is likely the composer did not consciously choose pitches with which to develop in a traditional manner. They are a product of extending found material or rather, the sound of freezing time. Little processing is incorporated that dramatically alters the incorporated material; the raven drumbeat, for example, is presented around the same duration each time, always with a 55.46 Hz fundamental. As the work progresses one can assume a larger hand on the material by the composer, most notably with the chords that conclude the work or the looped water samples in the penultimate section. However, this amount of alteration to the incorporated recordings is purposely minimal. She favors subtle juxtaposition and transformations of sounds rather than radical manipulation. As previously stated, the very use of this material forfeits one's compositional authority to a degree, in contrast from writing musical notes that a performer with an acoustic instrument interprets. Westerkamp did not dictate how the animals, wind, or water initially sound, and her work does not obscure, but rather, highlights their original sonic properties.

Numerous occasions where Westerkamp's clearly skilled craft is utilized in constructing the work are cited above. Beyond this, one may draw a narrative, imposing meaning behind the lone peep found near the end of the work. Different still, knowledge of acoustic ecology and the Carmanah Valley's history, now established as *Carmanah Walbran Provincial Park*, may lead to other conclusions. Much of this aligns with the social hopes set forth by Westerkamp and her

colleagues. For many composers, the raven and other transformed sounds could be approached as sound objects: raw sounds to process into musical material of the composer's desire.

Westerkamp's cognizance of agency, however, allows her to truly hear what a sound may do, its context, as well as what it offers sonically. It aligns with a living world with which she interacts and learns, not allowing audio processing to significantly divorce from original context in an effort to fabricate another world. She highlights what exists to further engage the listener with that space.¹⁰⁴ The piece offers an early example in history of allowing the originally obtained material to have significant authority, which leads to a work's construction.

¹⁰⁴ McCartney, *Sounding Places*, 145.

CHAPTER FOUR. MATTHEW BURTNER

4.1 BIOGRAPHY

“I only went out for a walk, and finally concluded to stay out till sundown, for going out, I found, was really going in.”¹⁰⁵

—John Muir

Upon expressing he was not particularly taken with a great variety of music offered by his teacher, Matthew Burtner (b. 1971) was encouraged to write the music he wanted to play. He has in many ways been doing so ever since. Born into a fishing family in the Bristol Bay region of Alaska, the composer studied at St. Johns College, Tulane University, The Peabody Conservatory, and Stanford University’s CCRMA, working with Max Mathews, Jonathan Harvey, Brian Ferneyhough, and others. What truly fostered development of his musical voice was the experience of his surroundings as a child. Playing melodies on the saxophone along with the wind, ice, and other sounds heard in Alaska, he found great inspiration that has grown to become a music in which human is set into dialog with some external, environmental force. Akin to this, he favors photography (i.e., realism) over painting (i.e., impressionism), and distrusts attempts to remove the human subjective from music. Alongside these early and continued experiences with nature were influences by Iannis Xenakis, having worked in his lab, and Barry Truax. Burtner sought out the latter and subsequently took a workshop of his at the International Computer Music Conference (ICMC) and then worked at WSP at Simon Fraser for a summer.¹⁰⁶

Currently a Professor of Composition and Computer Music at the University of Virginia (UVA), Burtner has not only continually gained accolades, but also found inventive ways for his music to be supported and shared with others. He was an invited researcher at IRCAM/Centre

¹⁰⁵ John Muir, *John of the Mountains; the Unpublished Journals of John Muir*, ed. Linnie Marsh Wolfe (Boston: Houghton, Mifflin, 1938), 439.

¹⁰⁶ Matthew Burtner, an interview by Cory Kasprzyk, February 2014.

Pompidou (2005) and an Artist in Residence at Cite International des Arts—both in Paris. Honors include many awards familiar to his field (e.g., Bourge, Gaudeamus, Darmstadt) and outside music, including a 2011 IDEA Award Winner from Internet2 and a Howard Brown Foundation Fellowship. This has led to work with a host of notable ensembles, recordings on DACO, The WIRE, Innova, and Centaur, and collaborations with those in varied arts. The latter has led to him presenting at NASA’s Goddard Space Center, discussing music for climate science, or having his music played at the U.S. State Department GLACIER Conference, part of President Barack Obama’s initiative on Climate Change in Alaska. Burtner’s presence at the GLACIER Conference also included an installation with an 800-pound piece of glacial ice with imbedded speakers playing a new piece, *Threnody (Sikuigvik)*.¹⁰⁷

Also striking are Burtner’s three evening-length multimedia opera/theater works: *Ukiuq Tulugaq (Winter Raven)*, *Kuik*, and *Auksalaq*. The latter, which garnered numerous honors including those from The American Prize, is telematic (i.e., musicians performing live in multiple geographic locations, achieved through internet technology). Additionally, it utilizes Burtner’s technology called NOMADS, which allows the audience to interact across multiple networks and directly influence the music in real time. Alongside remaining active as a composer, his list of honors continues to grow today, such as a \$30,000 Art Works Grant from the National Endowment for the Arts. He also maintains extensive work as a pedagogue, both at UVA and through his EcoSono Institute. The latter focuses on ecoacoustics, composition, and field recording in Alaska and abroad.

¹⁰⁷ Matthew Burtner, “Music for President Obama’s US State Department Glacier Conference,” Matthew Burtner, <http://matthewburtner.com/music-for-president-obamas-us-state-department-glacier-conference/>.

4.2 COMPOSITIONAL PROCESS AND AESTHETICS

As with discussion of Oliveros' work, requiring performers of the highest caliber or drawing a distinct line between audience and performer is not something to which Burtner always adheres. *Sxueak* (2006, toys and computer) is executed by those able to read basic rhythms and decipher a straightforward graphic score, making use of toys that squeak and can be humorously squeezed, twisted, and poked while the computer enhances the aural results.¹⁰⁸ Other works enable performers to turn their environment into an instrument without the prerequisite of rigorous conservatory training. This use of nature as an instrument naturally invites some compositions to be performed outside the concert hall. *Sandprints* (2009), stemming from his teaching at the University of Virginia, was performed by MICE (Mobile Interactive Computer Ensemble) in the Namib Desert.¹⁰⁹ Microphones buried in the sand yield a new control interface, allowing the ensemble to play their surroundings amid a whistled melody.¹¹⁰ Other pieces, such as *Six Ambient Extensions* (2010, percussion ensemble and electronics) or *Syntax of Snow* (2011, glockenspiel(s) and amplified snow) can be performed outside—the latter assuming there is snow on the ground.

Actively playing with the environment is an important and non-gratuitous feature in Burtner's work. The aforementioned *Syntax of Snow* asks performers to utilize a traditional instrument with one hand, while the other (gloved) hand plays snow. Each action with the snow is coupled with a note on the glockenspiel, treating the sources as one. The graphic portion of the score dictates specific gestures to pull great sonic variety from the snow as each distinct pitch is struck on the glockenspiel. The title nods to this use of snow and the act of performing outside as

¹⁰⁸ Matthew Burtner, "Sxueak," Matthew Burtner, <http://matthewburtner.com/sxueak/>.

¹⁰⁹ Matthew Burtner, "MICE (Mobile Interactive Computer Ensemble)," McIntire Department of Music, University of Virginia, <http://music.virginia.edu/mice>.

¹¹⁰ Alexandra Gardner, "Sounds Heard: Ecosono—Agents Against Agency," New Music Box, <http://www.newmusicbox.org/articles/sounds-heard-ecosono-agents-against-agency/>.

having depth. People and animals who live in a frequently snowy landscape can be informed merely by the sound of snow. It might inform the time of year, month, or day, or indicate weather conditions and other information, allowing nature to truly speak.

Composing for himself, as initially mentioned, has indeed continued with great success through the metasaxophone—an augmented computer instrument of his own creation. The utilized tenor saxophone works just as any other acoustic counterpart, but it happens to have an elaborate array of sensors, a proprietary microphone system, and a computer microprocessor. The instrument's sound can be amplified and altered, and physically moving the instrument in space can be tracked and used to control elements of the electronics. *S-Trance-S* (2001, metasaxophone) exploits a blur between physical and virtual instruments controlled by the metasaxophone to generate a physical modeling of a *bowed-string saxophone* hybrid. Aside from playing the instrument as one traditionally would, the closing of a key or the very act of moving the instrument in space controls the virtual bow speed, pressure, and other parameters. In more recent time, saxophonist Kelland Thomas (University of Arizona) has commissioned a second version of the instrument for his own use.¹¹¹

Of course, most germane to this document is Burtner's leading work in ecoacoustics. He has developed numerous techniques using technology to extract elements of an observed environment into his work. Technology allows him to zoom in on the details of a moment or to push outward to expose a macro-level form. Pieces like *Aa'a* (2009, flute, clarinet, amplified lava rocks, electronics) allow the listener to actually hear lava, as well as the acoustic instruments interacting with this sonic material. Additionally, *Spectral Arctic Ice Triangulations* (2010, amplified water percussion and 3-channel sound) offers the sound of ancient air escaping

¹¹¹ Matthew Burtner, "Metasaxophone Systems: Evolving New Music and Technologies for the Saxophone," CCRMA, Stanford University, <https://ccrma.stanford.edu/~mburtner/metasax.html>.

chunks of glacial melt. The piece also turns a tub of water into an instrument and utilizes harmony from *Sikuigvik*—a piece of focus later in this chapter—as a filter for the employed hydrophone recordings; the melting ice *plays* the older piece.

Nevertheless, what separates him from other composers discussed is that he rarely allows the incorporated field recordings to be explicitly heard in the final composition. Untouched respective sounds of a physical space from which a piece is derived may not be heard. Wind, recorded on the coast of Alaska, serves as the basis of *Windprints* (2005/2010, one to three flutes and mixed indeterminate ensemble), mapping observed properties in the recording to the instrumental parts in this purely acoustic piece. Sonograms are used to develop the work's overall shape. Nodding to acoustic ecology, the form of *Winter Falls* (2000, amplified double bass and computer-generated tape) is the result of a soundwalk. Different still, some compositions assign environmental elements to individual instruments, as is the case in *Tingnikvik* (2000, viola, alto saxophone, piano, video, and noise generators). Translating what can be seen, into something that can be heard, *Cloudprints* (2008-12, instrumental ensemble and computer ensemble) provides a sonification of cloud formations and movement. A score example can be seen in Figure 4.1.¹¹² Even Burtner's large-scale multimedia operas are composed with similar methods.¹¹³ As will be discussed, *Sikuigvik* is one of his initial works that allows nature to make large compositional decisions without direct aural presentation.

¹¹² Matthew Burtner, "'Cloudprints' for instrument ensemble and computer ensemble upcoming performances," Matthew Burtner, <http://matthewburtner.com/cloudprints-for-instrumental-and-computer-ensemble-upcoming-performances/>.

¹¹³ Matthew Burtner, "Ecoacoustics works," Matthew Burtner, <https://ccrma.stanford.edu/~mburtner/Ecoacoustics.html>.

Figure 4.1: *Cloudprints* score excerpt.¹¹⁴

The image displays two pages of a musical score titled "Cloudprints III, cloud 5". The score is written for a grand piano, with a treble clef on the left and a bass clef on the right. The notes are arranged in a way that suggests a connection to natural energy fluctuations, with some notes appearing as if they are being "scanned" or "mapped" onto a background of a cloudy sky. The notes are primarily in the lower register, with some higher notes in the treble clef. The score is titled "cloud 3.6" and "Cloudprints Matthew Burtner".

Considering this body of work, it is important to note that Burtner deeply believes in knowing a place through interaction. Pieces derived from his home of Alaska exhibit extensive knowledge of the source and its energy fluctuations and, therefore, a deeper connection can be found in the music. His music in collaboration with Namibia or Guatemala could be analogous to tourism. In all cases, however, the process of both making audio and video recordings in a space, learning about how its respective ecosystem exists, and spending significant time to physically experience it, all serve as informative in the compositional process.

The results are rooted in his interest in natural energy fluctuations mapped into musical parameters. He strives to compose in collaboration with the incorporated environment in such a way that the larger structures can be heard. While these facets from music, quite often formal structures, need practice to truly hear, Burtner finds the listener often perceives them subconsciously; these are articulations of events in time given over to the environmental system.

¹¹⁴ Matthew Burtner, "Cloudprints," Matthew Burtner, <http://matthewburtner.com/cloudprints/>.

They are “*prints* of environmental systems filtered through the human imagination.”¹¹⁵ This is not intended to seem broad or graze over details of a field recording, but rather to accurately, not arbitrarily, impose detailed data assessed from nature and place it onto the resultant piece. “I let the human system modulate nature and the natural system modulate the human system. In this way my work explores human/nature dialectics.”¹¹⁶ Harmonic structure can be tied to the environmentally-derived form. As we zoom further into the details of a work, however, these elements are composed more traditionally.

Interestingly, Burtner sees this manner of composition as not to remove the *self*, but rather refocus it toward one in communication with the environment, opening up to new forms of beauty despite human desire and expectations. This aligns with our ability to only control reactions and responses. “People who live in the far north of Alaska, the coldest place on the planet, never complain about the cold. Complaining about something suggests that you may be able to change it.”¹¹⁷ An agent in a system might desire, but that does not entail the ability to generate change. Musical forms, in terms of exposure, can embrace and highlight this conflict between ego and the environment.

4.3 ANALYSIS OF BURTNER’S *SIKUIGVIK*

Sikuigvik (1998, piano and large ensemble) does not feature electronics and is relatively early in Burtner’s catalog of works. It is significant, however, in that it is the first he qualifies as ecoacoustic.¹¹⁸ The approximately 19-minute piece was premiered in Norway, the same year of its completion, by Torleif Torgersen and the MiN Ensemble, to whom it is dedicated. While not

¹¹⁵ Matthew Burtner, an interview by Cory Kasprzyk, February 2014.

¹¹⁶ Ibid.

¹¹⁷ Ibid.

¹¹⁸ Matthew Burtner, “Ecoacoustics works,” Matthew Burtner, <https://ccrma.stanford.edu/~mburtner/Ecoacoustics.html>.

a concerto, the piano is heavily featured amid the remainder of the ensemble (i.e., flute/piccolo, oboe, clarinet, bassoon, horn, 2 violins, viola, cello, bass).

The composition is subtitled *The Time of Ice Melting* and indeed, *Sikuigvik* is the Iñupiat (i.e., Inupiaq) Eskimo word for this season. The piece musically captures this celebratory time of year. Simultaneously, climate change presents ice melt as a topic of grave concern, adding another layer to how the piece may be perceived. While possible to be heard in that manner, *Sikuigvik* was not initially about global warming. It presents environmental systems in a musical context, such as harsh Alaskan conditions. Later works of Burtner's more directly address environmental concern and the politics that accompany.

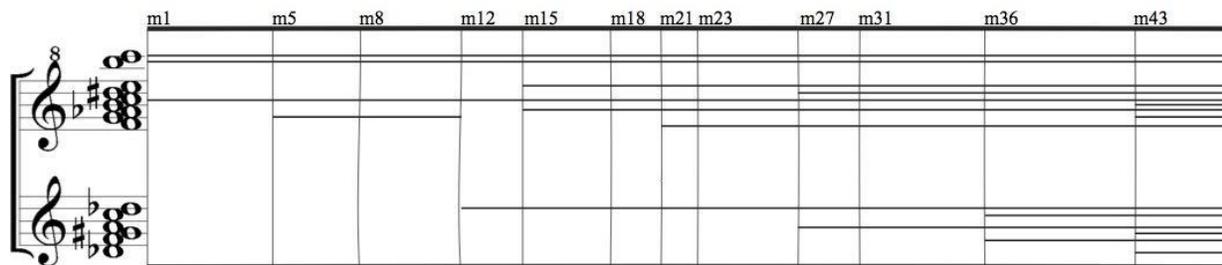
Representative of the composer's work, the formal structure is directly derived from the natural environment of the far North. Specifically, processes from ice melting determine formal structures and in turn inform harmonic and melodic material. Musical material is generated from observation of the thawing and freezing process of water. The piece initially builds to measure 73, when the piano first plays on its own for a significant amount of time. Looking to this introduction of the work demonstrates how the data is sonified, determining temporal structure, energy, and frequency. The evolution of texture in this initial section, as seen in Figure 4.2, offers numerous ways in which the ice musically thaws.

Figure 4.2: *Sikuigvik* score excerpts, contrast of pp. 1 & 15.¹¹⁹

Cracks in the ice are represented by the piano's initial notes: B⁶ and C⁷ (i.e., the highest notes present, a half-step apart, accented). The space between each fracture of ice is of varying duration, all determined from the data Burtner incorporated. These ice cracks typically introduce new pitches found within a chord that builds to measure 43, as seen in Figure 4.3. The initial notes presented by the piano are heard throughout this time, and newly introduced pitches tend to begin as sustained notes (i.e., frozen) that emerge from nothing. The harmony continually grows and, by virtue of the newest pitch frequently being the lowest present, one may perceive a modulation or destabilization of pitches previously heard as a pitch center.

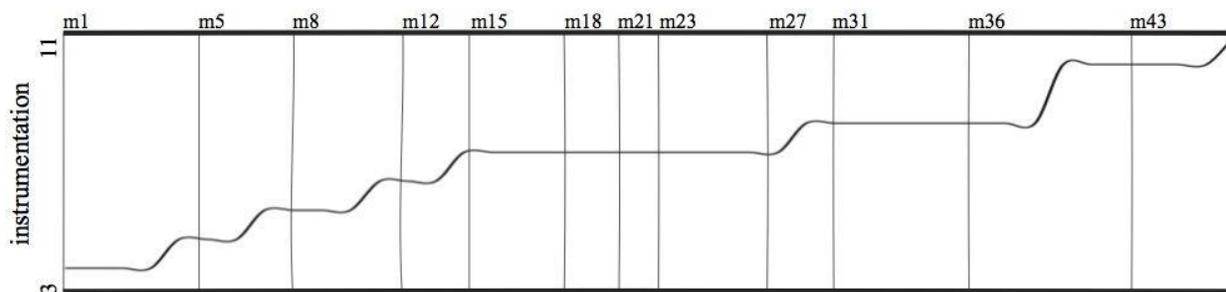
¹¹⁹ Used with permission by the composer.

Figure 4.3: Harmonic structure of measures 1-43.



While the ice cracks do not consistently serve as an orchestrational device, an overall trajectory corresponds. With the piano prevailing throughout, the work begins with three instruments playing. By measure 43, the entire ensemble is present, as seen in Figure 4.4.

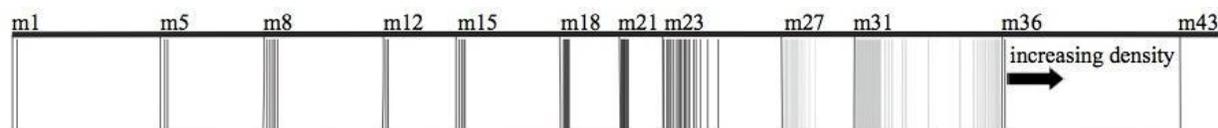
Figure 4.4: Instrumentation growth of measures 1-43.



What follows each ice crack also yields a similar trajectory. The winds move from air tone to tangible pitch. More notably is the increased growth of piano activity. As seen in Figure 4.5, the piano begins with the aforementioned B^6 and C^7 as long pitches that gradually disappear into the texture. This moves to brief, quick outbursts of notes that are then sustained by the other instruments. Moving from measure 43 and beyond, the piano remains active at almost all times within the duration of the cracks. In general, all instruments move to quick lines from sustained passages. Creating a syntax of *thawing* or *melting*, the harmonic growth, orchestration, and

overall shape presented within the work's initial few minutes obscure the frozen texture that initially prevailed.¹¹⁹ These elements coincide with the piano's ice cracks: a sonification of the incorporated data.

Figure 4.5: Piano rhythmic density within measure 1-43.



Moving onward up to measure 73, the harmonic structure is broken as new pitches are introduced, offering faster harmonic rhythm. Each sonority has between seven and nine pitches, largely derived through the addition and removal of half-steps. This fast harmonic change which contrasts the first 42 measures pushes toward the initial climax of the composition.

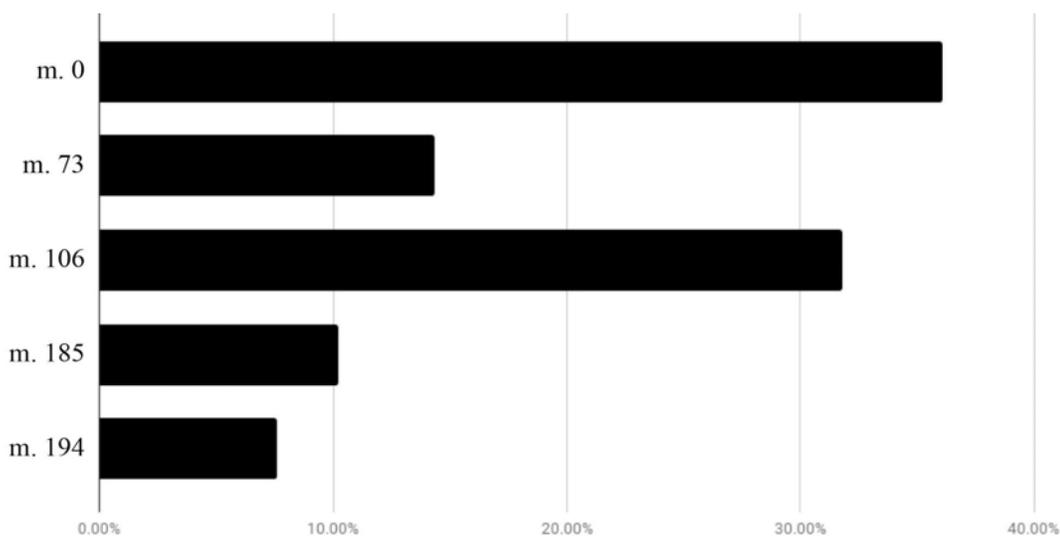
Within the aforementioned section, sustained lines are a memory replaced by fast repeated cells, tremolos, and arpeggios. With one final attack, all instruments depart, allowing the piano to offer a quasi-cadenza, providing a quiet calm verses presentation of virtuosity, moving back toward a refreezing of the musical material. The pitch C is initially heard and proves meaningful throughout the piano's solo. This and other portions of the piece where the piano plays alone help define sections and exhibit departure from the system initially presented. Burtner cites this as typical of ecoacoustic music; a composer begins with data sonification and then departs into an imagined landscape (i.e., "composing with the new system derived from the

¹¹⁹ Matthew Burtner, *The Syntax of Snow: Musical Ecoacoustics of a Changing Arctic*, in *North by 2020: Perspectives on a Changing North*, ed. Maya Salganek and Hajo Eicken (Fairbanks: University of Alaska Press, 2011), 657-9.

environmental process”).¹²⁰ We can hear this as the composer thaws and freezes the ice at will or presents the seasons in fast succession.

Assuming similar trends exist in the overall work, one may define sections through this alternation of ensemble versus piano alone. As seen in Figure 4.6, this generates uneven sections moving between group passages and piano. The percentages of each section are a result of analyzing the MiN Ensemble recording, but one can assume similar results from other performances.¹²¹ It is notable in that this overarching form, if derived from the employed data, is likely not one that would have resulted from the composer’s intuition. It demonstrates a new form that is a direct result of conversation between man and nature.

Figure 4.6: *Sikuigvik* sections, indicated by initial measure.



Continuing on a similar path of observation found within this document, numerous items can be seen as the incorporated environment determining the musical outcome. The idea of

¹²⁰ Matthew Burtner, an interview by Cory Kasprzyk, February 2014.

¹²¹ MiN Ensemble, *Arctic Contrasts* (MiN-ensemble, Norway: Euridice Records #012, 2001).

thawing and freezing water can be a romanticized gesture some may utilize, but *Sikuigvik* incorporates data that is imposed accurately upon the work. This in turn determines temporal events. When is the next occasion of the piano sharply hitting the B⁶ and C⁷? When will the next pitch appear? How quickly will the instruments be introduced? At what point will the texture have moved from largely sustained notes to rapid movement? *When* is a product of the employed data.

Nevertheless, it can be argued that the element of *when* is all nature determines in this context. The musical material, let alone the instrumentation, is a product of decisions made by the composer. This is not to say, however, that relation to nature only encompasses form in this work. Aside from temporal qualities informing other musical material, the piece is written by an Alaskan-born composer reflecting on a specific time and the experiences he had in a distinct geographic region. One may look to the air sound of the winds, which contribute to a sonic environment that nods to its aural counterpart. The juxtaposition itself of sustained pitches suddenly interrupted by accented piano gestures is not unlike the Alaskan experience—a volatile beauty in which resting on one’s laurels could lead to great danger. Nevertheless, this piece and those written in close proximity by Burtner represent not only a music influenced by experiences in a particular environment, but musical material directly derived from data associated with it.

4.4 BURTNER’S WORK AFTER *SIKUIGVIK*

If we view *Sikuigvik* as the genesis of a unique way about composition, we inevitably see progression with subsequent works. Over a decade later, Burtner composed *Iceprints* (2010, 1-3 pianos and electronics). This and other more recent pieces display a more overt social engagement, directly addressing climate change. As discussed in Chapter 2, *Iceprints* uses data

from four decades of polar ice change in the Arctic Ocean, offering a sonification of time beyond human perception. This speed through time reveals a disturbing trend of melting.

Specifically, *Iceprints* utilizes recordings obtained from three hydrophones positioned in a triangular shape, each a kilometer apart. While this formation is used by scientists to track the movement of animal life within the water and by military to track submarines, Burtner captures the sound of ice melting. Within the work, this is played by three corresponding speakers surrounding the audience, placing them virtually underneath the ice. These hydrophone recordings are also filtered, utilizing the harmony of *Sikuigvik*; we once again hear the old work articulated by the field recordings used in the new piece.

There are, however, many elements that vary from *Sikuigvik*. As we truly hear the field recordings, albeit altered, electronics are a crucial part of the performance of the piece. This is pushed further in that the piece offers a telematic element, utilizing performers in three separate locations. Additionally, a clearer presence of intent can be seen, offering program notes that discuss global warming. This, alongside placing the audience within a virtual version of the presented physical space, undoubtedly provokes thoughts related to the composer's concern for the fragile environment itself.¹²²

Burtner's work in ecoacoustics has continued, allowing snow, wind, and climate data to generate form and other musical material. *Snowprints* (2001, flute, cello, piano, snow, electronics, and video) presents syntactic organization of the sounds recorded. One may observe a variety of impressions in snow, including those made by gravity, melting, or humans and other animals. Each reveals a distinct set of conditions and sonic impressions, which were then categorized and used to determine many aspects of the piece. This approach in extracting

¹²² Matthew Burtner, "Iceprints," Matthew Burtner, <http://matthewburtner.com/iceprints/>.

environmental recordings to be used as expressive imperative sounds that drive a work varies from soundscape composition.

Like the ecological data sonification in *Sikuigvik*, *Windprints* demonstrates a distortion between changing air pressure and changing chords. Burtner carefully controls this so abstraction may not impede perception between the relationship of the dynamics and harmony the ensemble plays, with that of the timing, intensity, and energy of the observed wind gusts. As previously mentioned, interactive computer-generated models can be seen in Burtner's *Windtree*, an interactive light sculpture that tracks movement from surrounding dancers to alter a physical modeling of wind. This multimedia instrument is found within *Windcombs/Imaq*, the second portion of his opera *Kuik*.¹²³

These three techniques (i.e., syntactical organization of environmental sound, ecological data mapping, and interaction with environmental computer-generated models) create a language, sonic relationship, and technological interaction with the environment that is unique to ecoacoustics.¹²⁴ Additional examples can be found in pieces like *Winter Falls* (2000, bass and electronics), *Fragments from Cold* (2006, cello and electronics), and *Windsketches* (2005, metasaxophone). With Burtner's body of work, the presence of self-developed ecoacoustic techniques and sincere efforts to address global issues, are accompanied by a unique voice that continues to grow with each work.

¹²³ Matthew Burtner, "Compositions," Matthew Burtner, <http://matthewburtner.com/compositions/>.

¹²⁴ Burtner, *Musical Ecoacoustics of a Changing Arctic*, 653-666.

CHAPTER FIVE. JEZ RILEY FRENCH

5.1 BIOGRAPHY

“There is a reality—so subtle that it becomes more real than reality.”¹²⁶
—Alfred Stieglitz

Offering inimitable contrast in most contexts, Jez Riley French (b. 1965) is a British field recordist truly of self-design. A leader in his field, he has spent over three decades offering works that demand immensely concentrated listening. The British Library describes him as one of the most influential sound artists of his generation, nodding to his creative work, as well as efforts in field recording techniques.¹²⁷ He is also internationally sought out for lectures and workshops on field recording. The majority of his output is fixed media, exploring sounds typically so soft only select equipment can capture them. These efforts and a great command over his craft have cultivated an international presence, with commissions from Tate Modern, The Whitworth, the Museum of Contemporary Art Tokyo, Harpa (Iceland), and The Wire Lab (Australia). Additionally, his work has been exhibited alongside installations by such icons as Oliveros, Alvin Lucier (b. 1931), Annea Lockwood, Brian Eno (b. 1948), and Yoko Ono (b. 1933).¹²⁸

As previously noted, there exists a considerable link between field recording and photography, and French’s comfort lies in both. Aside from his photographs, he has coupled the two with his *scores for listening*: photographic scores, accompanied by brief written suggestions,

¹²⁶ Orvell Miles, *The Real Thing: Imitation and Authenticity in American Culture, 1880-1940*, (Chapel Hill, NC: University of North Carolina Press, 2014), 220.

¹²⁷ Mark Peter Wright, Interview with Jez Riley French. Interviews with wildlife sound recordists, (*Sounds*, British Library, 2015).

¹²⁸ Jez Riley French, “About,” Jez Riley French, <https://jezrileyfrench.co.uk/about.php>.

that are in turn realized by musicians.¹²⁸ This has also led to expanded output that includes video and installation art.

Additionally, he curates his own audio label *engraved glass*, publishes the online ‘zine *verdure engraved*, and runs *a quiet position*, an online forum devoted to field recording and sound art. The latter has afforded him opportunity to offer his expertise as a field recordist and speak out against social issues of concern such as gender inequality. Like experiencing his own pieces, heightened listening could yield a greater awareness of female sound artists and field recordists—those he feels would benefit from increased imperative attention. This mirrors criticism of individuals highlighted in the history of Western Classical Music and aligns with much of what Oliveros presented.

A truly unique aspect of his work is that he not only utilizes professional recording equipment obtained through sponsorship, but also constructs much of his own equipment.¹²⁹ His microphones serve as integral to his own output and countless other sound artists, and have been used by those associated with numerous television programs and movies, including *The Imitation Game* and the most recent *Star Wars* franchise. Most notably are BBC productions such as *Planet Earth with David Attenborough* or *Frozen Planet*, in which his microphones are utilized by noted field recordist Chris Watson. Among this equipment are his self-made contact microphones, hydrophones, pick-up coils to record electromagnetic fields, and geophones, which adapt seismic activity into an audio signal. These specialized microphones yield extensive exploration in ultrasonic and infrasonic sounds, exposing an aural landscape few have heard.¹³⁰

¹²⁸ Jez riley French, “Scores for Listening,” Jez riley French, <https://jezrileyfrench.co.uk/scores-for-listening---photographic-scores.php>.

¹²⁹ Jez riley French, “Sponsorships,” Jez riley French, <https://jezrileyfrench.co.uk/s.php>.

¹³⁰ “Jez riley French,” British Museum Collection, <http://britishmusiccollection.org.uk/composer/jez-riley-french>.

5.2 COMPOSITIONAL PROCESS AND AESTHETICS

Unlike the previously mentioned composers, Jez Riley French does not come from a background of rigorous formal training or tangible influence from those that came before. (He in fact, dropped out of school at the age of sixteen.)¹³¹ While one can draw a thorough history in field recording, it is clear French's work is based upon a sincere desire to expand his extensive experience, moving in the direction the recorded sounds dictate. Listening and life experience are his primary influences.

He typically records natural sounds (i.e., those not deliberately made by humans).¹³² Whether one can assign or fabricate agency to the sounds incorporated in his music, French does not align with conventional thoughts defining "nature/environmental recordist." Indeed, his connection and interpretation to an incorporated environment may change. He is, however, "more concerned with the way we (i.e., our species) establish norms and expectations and how they restrict or distort realities," which highlights a broader openness to listening to and utilizing a recorded environment. While marketed efforts may provide recordings of peaceful meadows and other composers may process the same sounds to their own desire, French avoids imposing his own purpose and simply listens. While not the genesis of his work, if a piece cultivates reconsideration for how one listens to and exists within a given environment, he of course deems this positive. In acknowledging coexistence, "self" is always present, but French has moved past the sentiment of turning an environment into his own desires.¹³³

One may physically leave a space and record for long periods of time to permit life to return to an undisturbed state. We can, however, move beyond the impact of an individual's

¹³¹ "Photography and sound," YouTube video, posted by SOURCE Photography Review, May 17, 2016, <https://www.youtube.com/watch?v=dRnuEVT9His>.

¹³² TEDx Talks, "Audible Silence."

¹³³ Jez Riley French, an interview by Cory Kasprzyk, January 2017.

presence in a space. French and many others with experience in field recording and related fields surmise that the individual recording has greater impact. Two individuals, side-by-side with the same equipment, would yield two subtly different recordings—their differences being a byproduct of the recordist’s perception. Specifically, French allows a space to impose itself on him, verses the contrary, through a practice of long-duration recording (and listening). He feels any sound can be interesting for two or three minutes, but what happens as one experiences a sound for 20 to 30 minutes?¹³⁴ Immersing into the incorporated space to observe the ebb and flow of a texture can avoid his own desire, instead listening to what the sounds themselves may offer.¹³⁵

These thoughts align with a desire to bring the world closer to us, by recording inside a beehive, for example. They also acknowledge humans as one of many species on a shared planet. Like acoustic ecology, this raises concern over sounds humans create, cannot hear, but are heard by other species. French has, for example, recorded many wired fences that with wind and other means of actuating, generate extensive sound.¹³⁶ With this intensive listening and in considering what acoustic ecology concludes, French feels while recording technology has positively developed over numerous decades, the inverse is true of human hearing. As the ear includes muscles, the highly-compressed, detail-lacking audio that has grown in availability, yields a society that loses its ability to truly hear the full aural dimensions of the world.¹³⁷

Nevertheless, documentation inevitably grew from the availability of recording technology. Acknowledging an inevitable element of chance in field recording, French moves beyond documentation, both with skill and intent. Akin to photographers bouncing light off

¹³⁴ Wright, *Sounds*.

¹³⁵ SOURCE Photography Review, “Photography and sound.”

¹³⁶ “Audible Silence: Jez riley French at TEDxHull,” YouTube video, posted by TEDx Talks, May 14, 2013, <https://www.youtube.com/watch?v=i44DDWfkS5I>.

¹³⁷ TEDx Talks, “Audible Silence.”

objects, his aural canvas is orchestrated through the reflections of sound in a given space. Recording this propagation and understanding how each element relates to another is not mere documentation, but rather his orchestration.¹³⁸

Utilizing the aforementioned specialized microphones and extended recording techniques, he has been able to explore structural vibrations, recording bridges or entire buildings. Contact microphones and hydrophones expose the micro-sounds of dolomites (i.e., a rock-forming mineral similar to calcite) dissolving or glaciers melting.¹³⁹ Viewing silence as an irrational description of environmental sound, he exposes that which is typically inaccessible to the human ear alone.

For those that utilize similar field recordings, apprehension may exist in music that is largely devoid of alteration or layering. And yet, French frequently offers pieces constructed of untouched singular recordings; the presence of one or very few field recordings simultaneously heard is not uncommon from him. Highlighting his fascination with the sounds themselves, this absence of digital processing or fabricated layering of sounds permits intense concentration on what was originally recorded. The sounds are frequently complex in their own right, offering more to discover with each listen.

This is not to suggest negligence, but rather that the process of composing begins even before the recording. French's expertise yields careful consideration for what is recorded and how it is captured. He frequently refers to personal intuition when discussing when to record and how to utilize the results.¹⁴⁰ His devotion to listening to many hours of bridge resonance, for example, leads to music that is the most fascinating excerpt of an extended complex soundscape.

¹³⁸ SOURCE Photography Review, "Photography and sound."

¹³⁹ Mohsen Manutchehr-Danai, *Dictionary of gems and gemology*, 2nd extended and rev. Ed., (New York City: Springer Publishing, 2005), 249.

¹⁴⁰ Jez riley French, an interview by Cory Kasprzyk, January 2017.

These methods can be observed in his innovative piece, *estonian strings* (2016, fixed media), a 42-minute piece exclusively created with hydrophones and contact microphones. Exploring frequencies in extreme ranges of human hearing and beyond, the piece is an excursion of Estonia's subtle and vast soundscape devoid of the aural pollution so customary elsewhere. One primarily hears cables—those for transmitters, chimney support, and fences—as well as abandoned piano wires and telephone lines. These “found cable” sounds, typically unheard by man, are the exclusive material for the work, which highlights his own discovery of their sonic potential. The slow, steady, harmonies draw one into a patient listening—a soundscape that seems otherworldly yet is presented untouched from its earthly source. What initially appears to be long drones of electronically-generated music are in fact carefully selected untouched field recordings that provide a wealth of detail for one to discover.¹⁴¹ This and other works present French's voice, which carefully draws our ears to the tiniest sonic details of the world that surrounds us. His output represents a highly-skilled enjoyment of listening, unconcerned with adapting to classification or personal desire.¹⁴²

5.3 ANALYSIS OF FRENCH'S *RESONANCES DI TOPOLO*

French's *resonance di topolo* (2011, untreated field recording and locale) is exemplary of his music and offers this document's most far reaching example in numerous ways. The piece is most readily available on the *engraved glass* label for digital download or online streaming.¹⁴³ In other words, the listening experience for this piece is most often at the listener's home, not necessarily the concert hall. In the case of the latter, one may experience time in a manner akin to

¹⁴¹ Jez riley French, *estonian strings* (Jez riley French, Frankfurt: Gruenrekorder, GrDI 106, 2012).

¹⁴² Jez riley French, an interview by Cory Kasprzyk, January 2017.

¹⁴³ Jez riley French, *resonances / residences* (Jez riley French, United Kingdom: engraved glass, egcd040, 2012).

the music of Michael Pisaro (b. 1961) or even Morton Feldman, albeit all are considerably different sonically. On the release, *resonance di topolo* is coupled with one other work, *residences de lumiere*. Within the accompanying notes, he encourages listening with a window ajar at a quiet time of day, balancing the volume of his music and the sounds present in the listening space equally. This offers a unique realization of the piece with each experience.

Little insight into the piece is immediately offered, short of it being a product of his residency at *Stazione di Topolo* in Italy. Program notes simply list that which was recorded: aquatic life in a stream, ants eating an apricot, and balustrades (i.e., bridges, balconies, or similar manmade items), distinguished for both *day* and *night* recording. As seen in Figure 5.1, contact microphones were modified to be adjacent to guitar strings and strung within the apricot.

Figure 5.1: Modified contact microphones strung through an apricot.¹⁴⁴

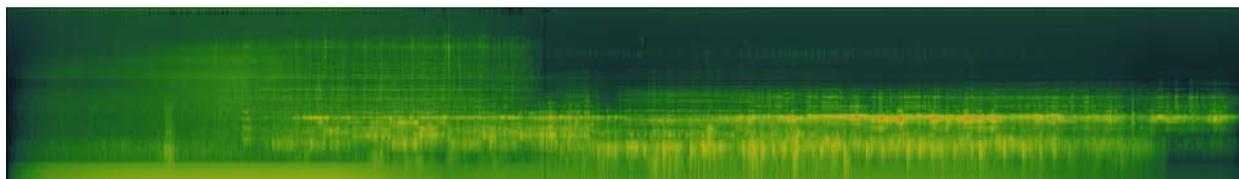


Preceding any further insight into the work a survey of varied examinations would be beneficial. Looking to the document's focus what is discovered may be paradoxical. Taking stock merely of what one hears and when these sounds occur, for example, yields a tangible display of the musical material found in the piece. Surveying the sonogram found in Figure 5.2, a general assessment of the piece may be discovered. Listening with this sonogram in view, one may observe the specific sounds recorded—aquatic life, ants, and balustrades—each of which

¹⁴⁴ Jez riley French, "a quiet position," Jez riley French, <http://jezrileyfrench-quietposition.blogspot.com/2011/07/>.

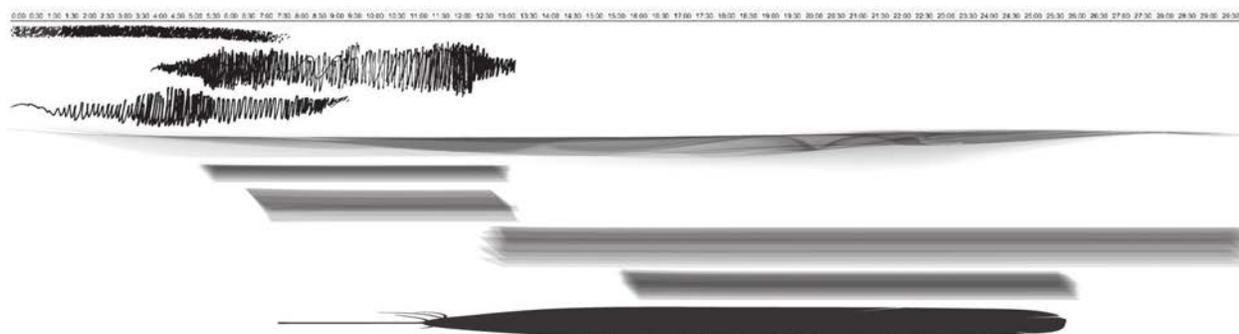
primarily occupies its own frequential space. This method of observation also reveals when large portions of the frequency spectrum are not utilized.

Figure 5.2: *resonances di topolo* sonogram.¹⁴⁶



Looking beyond the semiotic relationship of the sounds heard, another method may be to group sounds based on generalized character observing their presence. Each row in Figure 5.3 represents an assigned sonic character present in the piece, extending horizontally for its respective time. Specifically, they are munching, dry/brittle/crackling, dripping/clicking, airy hissing, humming, sustained moaning, subtle swelling, low rumbling, and tweeting sounds, respectively. Their graphic representation creates families of sounds, highlighting sonic similarities that ignore agency.

Figure 5.3: *resonances di topolo* character timeline.¹⁴⁷



¹⁴⁶ Sonogram created by Kasprzyk.

¹⁴⁷ Graph created by Kasprzyk.

The first 45% percent of the piece presents fairly stochastic crackling textures. Upon departure of these sounds, the foreground is then dominated by sustained sounds with more tangible pitch, swelling as birds chatter in the background. This view of the piece gains understanding of the work's form. Unrepresented in this graph are isolated sounds that offer ephemeral and satisfying variation. From 3:47 to 4:01, for example, a sound averaging around 39.49 Hz (D#1) moves from left to right; it may be imagined as a vehicle or other manmade item. Potential footsteps at 16:53 and a voice at 17:45 also function as brief, incomparable musical entities. Of particular note is the isolated bang at 27:10, which is followed by the piece's final decay.

Additionally, the preceding graph does not address variation in amplitude. At first glance, a generalized shape may be observed as the work begins from nothing, grows louder, and concludes by fading out. We may arbitrarily assign the dynamics *niente*—*mezzo forte*—*niente* over the half-hour that ensues. Of consideration are the peak values of amplitude within the work's waveform, observed through Root Mean Square (RMS) values. Akin to observing the highest point of a mountain, this yields generalized assessment of overarching amplitude and, in turn, informs the shape of the piece. *resonances di topolo* does begin from nothing, so much so that an initial listen may provoke alteration of volume. By 5:30, the piece reaches -37.5 RMS, moving to an average of -27.5 RMS around 10:00. There is some calm at 15:00, but the piece grows five-minutes later as it reaches -19.5 RMS. Within this time, there are sporadic peaks reaching an average of -9 RMS—brief and fleeting moments that stick out in the context of this section and the entire work. In reaching 25:41 and afterward, the piece returns to -32.9 RMS and essentially continues to decay to the end.

In the context of this piece, moments of tangible pitch are a contrast likely observed. While specific pitches are offered in the following analysis, these are averages found from sections deemed representative of a prevailing sonority. In light of this, potentially common pitches may be found among those within close proximity. In other words, two pitches only a quarter or half-step apart may be perceived over time as essentially the same pitch. With this in mind, the four notable sonorities of the work, as seen in Figure 5.4, first appear in the beginning, at 5:39, 6:23, and around 13:00 respectively. From this, D is found to be present throughout. A^{1/4}-flat and C^{1/4}-flat are found in all but one of the sonorities. The same is true of F; the one sonority which does not contain F, however, includes an E. It should be noted that this does not account for octaves; the pitches are found in all ranges of the spectrum at least once. Despite being separated at times by several minutes, these commonalities may be subconsciously heard as the piece progresses. This is particularly true amid limited pitch material in the context of music where one's focus may predominantly be with texture.

Figure 5.4: Tangible sonorities found in *resonances di topolo*.

† † These symbols indicate 1/4-sharp and 1/4-flat, respectively.
 Arrows on other accidentals indicate a deviation of 1/8th tone.

Different still, one may ponder the relevance of recording balustrades in the day and night. Some discussion may entertain the presence of these elements, exploring potential relationships among aquatic life, ants, and supportive structures built by man. Additionally, a volatile nature can be heard in some of the tangibly-pitched chords that swell in the second half of the work, perceived as a quiet extreme. These subjective views offer varied insight, but are likely more personal in nature.

None of these means of analysis are able to consider the locale that may become part of the listening experience. The chance component (i.e., including the listener's locale) yields an addition to the experience. While some experiences may seem more fitting than others, all are considered valid, at least according to French.

The aforementioned views offer compelling insight, but it is most crucial to consider the role of the composer in the piece's creation. Knowing French's work, one may assume the following decisions were intuitively made in the compositional process: what was recorded and then utilized, when these long untouched field recordings begin or end, and if they are layered at any point in time. Naturally, one also considers the modified contact microphones with guitar strings that are in some ways atypical and all that occurred before and during the recording process. Some specifics of these decisions are left as knowledge exclusive to the composer. However, it can be assumed that the work's precisely 30-minute duration is a decision by French. Within this document, in considering these items being the extent of the composer's fingerprint on the musical material, the piece can be viewed as exhibiting the most amount of musical input relinquished to the observed environment. This is by far not a gauge of assessment, but rather highlighting commitment to French's intent, admiring his craft in the entire creative

process. In hearing the piece, one experiences an excerpt of the life French captured on a given day through the enhanced ears of his microphones. It is his emotive sense of place and the sonic textures found within.

CHAPTER SIX. CONCLUSION

6.1 SUPPLEMENTARY CASES

"This silent rock, this nature about which we argue so much, is also among the most important things we have in common. That is why we care so much about it. It is, paradoxically the uncommon ground we cannot help but share."

—William Cronon¹⁴⁸

Of course, examples that align with what has been provided in this document are in prevalence. Each may be tied to some of the overarching aesthetics offered, yet also present an individual voice. Briefly, one can look to the work of Rand Steiger (b. 1957). A composer and conductor of international regard, he boasts numerous recordings on reputable labels (e.g., Centaur, Mode, Nonesuch, Tzadik), was a 2015 Guggenheim Fellow, a Visiting Professor at Harvard University, and is currently a Distinguished Professor at the University of California, San Diego.¹⁴⁹ Within one of his three residences at IRCAM, he developed the work *Ecosphere* (2002, ensemble with audio signal processing and spatialization). The 30-minute piece is scored for flute (piccolo, alto), oboe (cor anglais), clarinet (bass), 2 clarinets (contrabass), 2 horns, trombone, 2 keyboards, 2 percussion, 2 violins, viola, cello, and bass.

The work's program notes acknowledge the complexity and fragility of Earth's ecosystems, alongside a human-driven alteration of great proportions. Noted geographer Robert Bailey's (b. 1939) classification of terrestrial ecosystems serves as an influential model for *Ecosphere*. Bailey offers the domains (i.e., polar, humid, temperate, dry and humid tropic), which are in turn divided into 15 regions. There exists a delicate balance among these

¹⁴⁸ William Cronon, *Uncommon Ground: Rethinking the Human Place in Nature*, (New York City: W.W. Norton & Company, 1996).

¹⁴⁹ Rand Steiger, "Biography," Rand Steiger, <http://rand.info/rands/text/bio.html>.

classifications within Earth's land mass, and humans continue to cultivate negative dramatic change.

Steiger offers a continuous work divided into sections that each relate to one of Bailey's regions. They are temporally proportioned to their corresponding ecosystem, nodding to a representative city within the program notes. Among them are subarctic (Fairbanks), tundra (Reykjavik), marine (Paris), tropical desert (Djibouti), savanna (Madras), or icecap (Byrd Station). Each section offers varied textures that are the result of considering additional data from each region. Steiger admits this is the extent to which the data informs the work, composing freely beyond the aforementioned, to create a journey through sonic terrain.¹⁴⁸ To what degree the environment informs the work may be viewed as limited, but its impact on formal structures, large and small is meaningful.

While beyond the scope of this document, it is worthy to continue analysis of works such as those by Steiger, French, Burtner, Westerkamp, and others, drawing commonalities that encapsulate these efforts. How an environment is observed, preserved, and employed yields a plethora of options for composers, even when sincere effort to forfeiting musical outcomes is exhibited.

6.2 VEGANISM

Understandably, discussion of food at this juncture may be deemed a poorly executed subliminal message or merely gratuitous. It will come to be, however, that the values instilled in veganism can yield a powerful departure for the musical endeavors explored at hand. As this

¹⁴⁸ Rand Steiger, "Biography," Rand Steiger, <http://rand.info/rands/text/ircam.htm>.

movement is no stranger to misunderstanding and controversy, this momentary departure is necessary.¹⁴⁹

In brief, vegans abstain from the use of animal products to the best of their ability. While meat, dairy, and eggs are not consumed, the idea extends beyond what one eats, addressing clothing, animal tested products, forced work and entertainment, and other areas, which deem these fellow earthlings as commodity.¹⁵⁰

Just as there exists subtle deviation in the extent to which one commits to these ideas, there is variance in reasoning. The impetus for such a lifestyle can be grounded in animal liberation from human exploitation, personal health, or driven to achieve a reduced ecological footprint. While frequently in the subconscious, meat cannot be consumed without the death of an animal. Delving further, corruption within the dairy industry demonstrates additional animal rights concerns.¹⁵¹ Dr. Colin Campbell's *The China Study*, the most comprehensive nutritional study in existence, is only one of countless sources that demonstrates relationships between animal product consumption and common illnesses (e.g., heart disease, diabetes, certain cancers).¹⁵²

Moving beyond care for animals or one's self, the use of animal products, in considering its production to the dinner table, is arguably one of the most damaging efforts for the health of our planet. From the comparatively vast amount of water and grain required of beef production, to the environmentally damaging means of mass production and delivery, one of the biggest

¹⁴⁹ Richard Kahn, "Towards an Animal Standpoint: Vegan Education and the Epistemology of Ignorance," in *Epistemologies of Ignorance and the Studies of Limits in Education*, ed. Erik Malewski and Nathalia Jaramillo, (Charlotte, NC: Information Age Publishing, 2011).

¹⁵⁰ The Vegan Society, "Definition of Veganism," <https://www.vegansociety.com/go-vegan/definition-veganism>.

¹⁵¹ David Robinson Simon, *Meatonomics*, (Newburyport, MA: Conari Press, 2014).

¹⁵² T. Colin Campbell & Thomas M. Campbell II, *The China Study*, (Dallas: BenBella Books, Revised edition, 2016).

contributors to an ailing climate relates to what exists on dinner plates.^{153,154} Veganism acknowledges that “the earth can produce enough for everyone’s need, but not enough for everyone’s greed.”¹⁵⁵

There are values that may be drawn from those that recognize any or all of these issues, and in turn live in a way to counteract. Veganism may be seen as pursuing the least amount of negative impact. Amid increased demand for quinoa, critics quickly point to negative effects on Bolivian people, where the grain is native. Others merely discount all efforts made by a vegan at the site of an old leather belt. This *tu quoque* fallacy (i.e., look who’s talking) likely ignores facts, and undermines the premise of striving for a set of values, knowing perfection is unattainable.

6.3 FOUND COMPOSITION

Perhaps the ideal, rarefied view of *nature*, as defined by humans, may be a means of subconsciously exerting power. In viewing nature as *beautiful*, do humans ignore a climate in substantial decline? Geographer Neil Smith (1954-2012) argued against presentation of nature as a material object. Considering varied ideological or socially driven views, infinite definitions of nature exist.¹⁵⁶ One always listens in the context of their illusory correlations, their experience, and their presumptive values. Some may look further into excursions that address the manner in

¹⁵³ Nick Pengergrast, “Environmental Concerns and the Mainstreaming of Veganism,” in *Impact of Meat Consumption on Health and Environmental Sustainability*, ed. Talia Raphaely and Dora Marinova, (Hershey, PA: IGI Global, 2015), 106-117.

¹⁵⁴ Emre Ulusoy, 2015. “I think, therefore I am vegan: Veganism, ethics, and social justice.” Paper presented at the *40th Annual Macromarketing Conference*, Chicago, June 25-28, 2015.

¹⁵⁵ “Philip Wollen: Animals Should Be Off The Menu debate,” YouTube video, posted by Kindness Trust, May 16, 2012, <https://www.youtube.com/watch?v=uQCe4qEexjc>.

¹⁵⁶ Neil Smith, “The Production of Nature,” in *Uneven Development: Nature, Capital and the Production of Space*, (Athens, GA: University of Georgia Press, 1984), 34-65.

which they coexist. Similarly, a composer may see the world as something to experience, instead of an adaptive commodity for their artistic endeavors.

Considering this, could one propose a *vegan music*? A composer's hypothetical efforts that pursue as little negative impact as possible can then approach a greater understanding of found composition. Veganism addresses the interconnectedness of a complex ecosystem. In using an environment for musical material, consideration for these connections is imperative. As existence inherently entails impact, the same may be true of employing a given environment in any musical context.

In considering all that has been submitted, a working set of values in the absence of definitive meaning can be posited for found composition. Contemplation must include the manner in which technology is incorporated, awareness of the environment employed, and the impact of the composer's decisions on the final result, as compared to the natural source. The treatment of these areas may lead to values that are deemed aligning with this discussion.

Specifically, the use of technology is not hypocritical, but rather a means of achieving greater understanding for that which is observed. It is a necessity in the process of found composition, enabling greater observation. In considering whether such works must be reproducible to some degree, technology likely cultivates a solution.

The observation in question encompasses any system one may occupy, discerning agency and authority. Considering the observation and engagement with an environment for a piece, a composer admonishes dichotomy. Aligning with the spirit of Earth's codependence, an urban-versus-rural distinction is limiting. Therefore, viewing the use of an environment in musical context is one that may extend from field recording in the Amazon Rainforest or Times Square.

This document has questioned to what degree musical decisions are yielded to the respective environment of a piece. It is not feasible for the creator to relinquish *all* but still claim authorship—they must do *something*. Extending beyond Cage's seminal *4'33"*, the composer recognizes by virtue of proclaiming a work will exist, fully relinquishing one's role is not attainable. One consciously renounces herself or himself as sole creator of the music to an environment, acknowledging within a complex interconnected system, where only responses and reactions can be controlled. In utilizing that which is observed, the least negative impact (i.e., retaining essence) is pursued. Encompassing the pursuit of these values, one might explore new territories, producing socially conscious, relevant works in collaboration with an environment, yielding a prominent voice away from one's self in an informed manner.

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APPENDIX A. INTERVIEW WITH HILDEGARD WESTERKAMP

The following unedited responses were received by email.

CK: Listening to your own work, how aurally tangible is the relationship between the incorporated environment (e.g., the soundscape of the field recording used), and resultant the composition? Does the perception of this relationship match your intention (i.e., does it matter if an audience hears aural similarities between the source material and the piece itself)?

HW: No, it does not matter that listeners consciously perceive the connection or aural similarities between the original source sounds and their processed versions or even the final composition. As a composer I have no control over how any given piece arrives in the audiences' perception. However, many listeners may make an *intuitive* connection, sensing how the original sounds inherently belong to any given piece. And for those who are interested in delving deeper into the inner workings of the compositional process, the programme notes often highlight the connection between source sound and their compositionally altered presence.

From my perspective as the composer, it is precisely this relationship between original recording and its final place in a composition as well as its processed versions that drives my compositional process. It is a process of discovery and inspiration that plays a large part in the emergence of form in a unique way in each composition and thus enables a deepening understanding of its content. Some of this I will describe below in connection with *Beneath the Forest Floor*.

CK: How influential is environmental concern and social change related to your compositional process? To what degree was it a goal for your composition to increase others' awareness of environmental concern?

HW: It is an overarching concern in all of my work (i.e. my writing, workshops, my work within the World Forum for Acoustic Ecology, as editor of *Soundscape - The Journal of Acoustic Ecology*, in leading soundwalks, and so on) and certainly triggered an early desire in me to create compositions with a message, with something to 'say' about place, about certain situations, about listening. My compositions express these messages in varying ways, depending very much on the type of source material available through my recording process. My very first composition *Whisper Study*, is based on a sentence by Kirphal Singh, "When there is no sound hearing is most alert", which was spoken by myself in a whispered voice. Already then, my intention was to provide a space of time for listeners to think about silence during the duration of the piece, about this sentence and to contemplate its meaning. *A Walk through the City* is more directly expressing social concerns about Vancouver's downtown eastside, wanting to raise awareness about it through the human voices and local soundscapes in that area. These are just two

examples but I could probably name any one of my compositions as examples of some sort of intention to address a theme, and always to address listening attention.

I can't say that it was a thought-out *goal* of mine to increase awareness of issues in the sound environment. Rather, the experience of listening with much intensity, curiosity, inquisitiveness and depth to the soundscape while working with the World Soundscape Project (WSP), as well as studying all aspects of sound, acoustics and soundscape ecology created a strong inner urge to share and spread what I was learning and to express all this creatively through sound. I had never composed before, but it felt like I was finding a voice of expression that suited me.

CK: In your view, how much was relinquished to elements observed in the incorporated environment (i.e., compositional decisions were determined because of environmental observation)?

HW: Composing with environmental sound is like working with a language that already carries its own meanings. So, it is similar to writing with words – it is a conversation between the sound meanings in the original recordings and the composer's own compositional language/music preferences. The nature and quality of an environmental sound will often determine how – or whether at all - it will appear in a composition. Sometimes when certain sounds are explored through processing, they may influence the direction and format of a composition, as I mentioned above already. This is an essential characteristic of composing with environmental sound: each sound has its own powerful voice to offer because of its specific qualities and message and may thus interact with my own compositional intentions in a new and originally unintended and unexpected way.

CK: Is the process of allowing an observed environment to significantly inform musical decisions an attempt to remove the “self” or “ego”?

HW: I would put it slightly differently: if the composer is interested in letting the meaningful voice of an environmental sound ‘speak’ – beyond using it exclusively as a musically interesting sound source – such a sound inevitably informs her or his musical decisions. In other words, composing with environmental sounds in that way, is always a conversation - as I mentioned above - between the meanings in recorded sounds and the composer's musical voice and preferences. It is a dance between the two. This is the essence of soundscape composition. So, ideally self and ego stay out of it altogether.

CK: Your work makes extensive use of electronics, a medium that many cite as inherently bad for the environment. In creating your music, do you find irony in this idea, or see technology as a means of greater exploration and articulation of environmental observation?

HW: Yes, I am quite aware of the inevitable contradiction and irony in creating electroacoustic pieces, needing electricity for each step of the process, to record, compose and play back my pieces. But the fact is that the microphone as a third ear has the power in our media-weighted times to jolt us into a more aware listening stance, to give us a very necessary, and critical perspective on the environmental conditions in our soundscapes. It certainly had that effect on me when I started recording. In that sense the technology is not ‘bad’. As with all tools, it depends on the perspective, approach and awareness of the user of the technology. If it helps to get listeners to go out into the soundscape and listen with new ears, move through it with their bodies, then perhaps one can stop using the technology after a while and find an unmediated relationship to the soundscape.

And in fact as I am getting older, I actually prefer to listen to the environment with my ‘bare’ ears, to take people on soundwalks - and to instruct them on how to lead soundwalks themselves - without applying any technology, i.e. to create a framework for anyone interested to understand listening more deeply and thus their aural relationship to the environment.

CK: Are there composers or artists that have influenced your compositional approach? Specifically, did these individuals push you toward any of the concepts highlighted in this interview (e.g., “found composition,” ecological awareness, the degree of compositional authority, etc.)?

HW: My work with the World Soundscape Project and R. Murray Schafer in the 70s opened me to the possibility of becoming a composer. I was fascinated by the idea of listening to the whole world, to hear the musical possibilities in environmental sound. It expanded my ear’s attention beyond the traditional approaches of the classical music world in which I grew up, to the seemingly limitless and fascinating arena of all soundscapes in the world. My colleague Barry Truax, also a member of the WSP, was really the one who encouraged me to work in the studio, taught me some of the classic tape studio techniques in the then analog Sonic Research Studio, and in the end recognized the quality of my first compositions. I loved the listening and composing process in the studio - and specifically working with environmental sounds - so much that I felt I had found my medium, my artistic language.

CK: If at all, how have any of the following fields informed your work: acoustic ecology, soundscape composition, ecoacoustics, sonification, phonography?

HW: The World Soundscape Project was pretty much the birthplace of acoustic ecology and yes, this entirely new field determined the pathway of my subsequent career. With a lot of subsequent research, writing, teaching, giving workshops, creating projects of various kinds, and composing, not to mention our dedication, passion and imagination, myself and a number of colleagues continued to raise awareness, eventually organized conferences, founded the World Forum for

Acoustic Ecology and edited both the *Soundscape Newsletter* as well as *Soundscape – The Journal of Acoustic Ecology*.

My work with the WSP – not my earlier music studies - inspired me to start composing. At that time the term soundscape composition did not really exist yet. Many of my compositions came before the term for this type of composing was created!

Radio had a big influence on me while growing up in Germany, where I listened to a lot of radio drama (“Hörspiel”). Already in the 50s and 60s German Hörspiel was extremely interesting in its use of sound and sound effects and much of it could now be classified as early explorations in radio and sound art. In the 70s shortly after I had emigrated to Canada, and while I was working with the WSP I had the opportunity to experiment with the radio medium on the newly established Vancouver Co-operative Radio station. It was on this station that I produced and broadcast my programme *Soundwalking* in 1978/79, a weekly one-hour show that led listeners through many soundscapes in and around Vancouver.

Similarly the terms ecoacoustics, phonography and possibly even sonification all emerged during the same time, as recording equipment became more widely available and as ecological concerns and noise pollution problems became legitimate environmental issues.

CK: Who would you consider your contemporaries (i.e., others working in a similar manner or with like-minded concepts that embrace the topics we have discussed)?

HW: When I first started, I would have named, Murray Schafer, Pauline Oliveros and John Cage whose approaches to listening, composition and the environment inspired me deeply and had a huge influence on my own work. Nowadays there are many more colleagues with whose work I connect because we all share a common interest in environmental listening and a concern for the soundscape. In one way or another we express this in our work, whether it is through composition, acoustic or sound design, field recordings of natural environments, soundwalking, teaching courses in soundscape studies, acoustic communication, acoustic ecology and design, soundscape and music education and so on. The World Forum for Acoustic Ecology has organized conferences quite regularly now in the last 10 to 15 years and a growing network of international colleagues gathers there regularly. This has been an exciting development and I see that other conferences crop up everywhere not necessarily connected directly to the WFAE network but in spirit pursuing a similar interest in an ear-minded approach to the world, acoustic ecology, attempting to make changes to disturbing trends in our sound environments.

Acoustic ecology is a multi-disciplinary field and as a result my colleagues come from many different professional and cultural backgrounds with many different approaches and perspectives. We all share the same concerns about the sonic environment and listening but may

have different emphases in our professional approaches. There are actually too many to name. My contemporaries are all in the cross-disciplinary networks and overlapping communities that have developed over the years and made acoustic ecology a field of expanding interest. I am deeply thankful for what I have always perceived as a special connectedness among all of us ear-minded people in many parts of the world.

CK: If you did not utilize field recordings, environmental observation, or similar elements, do you feel your music would sound substantially different? How might you approach the compositional process?

HW: My interest in composing was triggered entirely through my work in soundscape studies and acoustic ecology. With environmental sound I wanted to ‘speak’ about the conditions of the soundscape, wanted to comment, critique, to create pieces for a certain kind of listening, pointing audiences towards the environment, its sonic beauties as well as problems. The world of sounds is so rich with endless expressive possibilities to explore, that I have neither had the space, time nor really the interest to branch out into other kinds of compositional approaches – other than composing a few electroacoustic pieces that also included live instruments. I have often wondered what would happen if I composed for acoustic instruments alone, what my music would sound like. I have no answer to this. But I do have the feeling that before I would go in that direction, I would choose to compose with words first.

CK: In composing *Beneath the Forest Floor*, how much influence do the field recordings have on the form of the work? For example, are longer recordings used and unaltered, or is it more common that short passages are connected?

HW: The form of the work evolved very much from the sounds I recorded. These are used in various ways in the piece, from longer unaltered, to shorter passages, to short ‘sound ‘objects’ that have been processed into abstract unrecognizable musical entities. And all of these are layered with each other to varying degrees and densities. More on this in my attached longer programme note for the piece, which I may not have sent to you before.

CK: The program notes for *Beneath the Forest Floor* paint a detailed picture that allows the listener to envision the primary space of recording. Considering yourself an “ecologist of sound,” do you hope a similar experience occurs for the listener (i.e., hearing the peaceful space in a way that stirs the imagination in a visual way)?

HW: My idea has always been – and not just in this composition – to provide a listening space and time for contemplation, for immersion into the sounds and into the listener’s own imagination and inspiration, indeed for an opportunity for the imagination to be stirred in any possible way – not just visual. More importantly I am hoping that the experience of listening to

this piece, will activate the listener into visiting places like this, in order to get to know them viscerally, understanding the value of forest in their own lives. My composition *Kits Beach Soundwalk* has had this effect on some listeners: several people, when they have visited Vancouver have also visited Kits Beach, to experience for themselves its acoustic nature and the place where this composition originated.

CK: *Beneath the Forest Floor*, as you have written, moves us through the visible forest, into its shadow world, its spirit; into that which effects our body, heart and mind when we experience forest. Does this in turn affect the overall form of the work, or simply set the stage for the listener?

HW: The programme notes were written after I completed the composition. So, in a way they describe my own journey while composing and therefore want to share this experience with my audience, knowing full-well that I have no control over how people will hear this piece. It is more like wanting to share the incredibly deep involvement with the sounds, the surprises and excitement while composing. Because the piece allowed me to explore my own ideas about forest, my own experiences with and thoughts about forest and it is that which I want to share when I write those words. The form of the work emerged from this combination of working with recorded sounds and having my own life experiences with and ideas about forest environments.

CK: You encourage listeners to visit the incorporated space (i.e., Carmanah Valley), citing the significant devastation clear-cut logging has caused. As seen in acoustic ecology, do you regard this, and other works, as a vehicle for social change? If this is the case, is music one of many mediums to create awareness of the topics about which you are passionate?

HW: Yes. I think I answered the rest already.

CK: Your experience in Carmanah Valley may have informed the resulting composition, and the valley's soundscape is likely quite different from when you recorded in 1991. Have you visited and/or recorded again in this place? If so, what observations are drawn from listening to Carmanah after 1991?

HW: Unfortunately I have not yet returned to the Carmanah Valley. But I do know that half of it was saved and declared a Park thanks to the incredible activist work of the Western Canada Wilderness Committee and other organisations, before the entire valley got clear cut. It's now called the *Carmanah Walbran Provincial Park*.

See: <http://www.env.gov.bc.ca/bcparks/explore/parkpgs/carmanah/>

Or: http://en.wikipedia.org/wiki/Carmanah_Walbran_Provincial_Park

CK: Are there additional thoughts you wish to add, related to *Beneath the Forest Floor* and the addressed topics in these questions?

HW: Please find attached [below] my long programme notes for *Beneath the Forest Floor*. As well please check out my article “Linking Soundscape Composition and Acoustic Ecology”:

<http://www.sfu.ca/~westerka/writings%20page/articles%20pages/linking.html>

If you haven’t already seen these, they may answer additional questions.

BENEATH THE FOREST FLOOR

an electroacoustic composition for audio tape

Program Note

Beneath the Forest Floor is composed exclusively from sounds recorded in old-growth forests on British Columbia's westcoast. The piece attempts to reach beyond the visible forest, into its shadow world, its spirit; into that which effects our body, heart and mind when we experience forest.

Most of the sounds for this composition were recorded in one specific location, the Carmanah Valley on Vancouver Island. This old-growth rainforest contains some of the tallest known Sitka spruce in the world and cedar trees that are well over one thousand years old. Its' stillness is enormous, punctuated only occasionally by the sounds of small songbirds, ravens and jays, squirrels, flies and mosquitoes. Although the Carmanah Creek is a constant acoustic presence it never disturbs the peace. Its' sound moves in and out of the forest silence as the trail meanders in and out of clearings near the creek. A few days in the Carmanah creates deep inner peace—transmitted, surely, by the trees who have been standing in the same place for hundreds of years.

Beneath the Forest Floor is attempting to provide a space in time for the experience of such peace. Better still, it hopes to encourage listeners to visit a place like the Carmanah, half of which has already been destroyed by clear-cut logging. Aside from experiencing its huge stillness, a visit will also transmit a very real knowledge of what is lost if these forests disappear: not only the trees but also an inner space that they transmit to us: a sense of balance and focus, of new energy and life. The inner forest, the forest in us.

Beneath the Forest Floor was commissioned by CBC Radio for Two New Hours and was produced in CBC's Advanced Audio Production Facility in Toronto with the technical assistance of Joanne Anka and Rod Crocker. Thanks to Norbert Ruebsaat for providing his recordings of an

adult raven and a young raven from the Queen Charlotte Islands. All other recordings were made by myself mostly in the Carmanah Valley on Vancouver Island, as well as in forests near Cowichan Lake on Vancouver Island, on Galiano Island and in Lighthouse Park near Vancouver. All sounds were recorded throughout the summer of 1991. Thanks to Peter Grant for assisting in much of the recording process. Special thanks go to David Jaeger, producer of Two New Hours for making this possible and for giving me the opportunity to work in the above-mentioned all-digital facility at CBC Radio, Toronto.

Notes on the Compositional Process

In the absence of a score or a print-out of the final 16-track mixing score on Aufiofile, I will give additional information here for clarification of the compositional process.

All sounds in this piece were derived from sounds recorded by myself in the above-mentioned old-growth forests. Processing techniques were relatively simple (slowing down for pitch changes, equalisation and filtering, sampling and looping, some reverberation). The aim was to re-compose the forest environment with its own recognizable, unchanged sounds on the one hand and to explore its acoustic/musical depths by processing some of its sounds on the other hand (e.g. the sounds of the raven, song birds, squirrel, creekwater).

The "drumbeat" that appears at the beginning of the piece and re-appears throughout carries particular meanings for the piece. It was "found" by slowing down one of the recorded raven calls and its timbre is reminiscent of the native Indian drum on B.C.'s westcoast. The raven itself is one of the totem animals in the native Indian culture and can be seen in the totem poles of various tribes. Totem poles are made from the trees of these old-growth forests and tell the tales and legends of native life within them. The drumbeat then, became the sonic/musical symbol or totem for the piece, representing the deeply ecological co-existence between forest life and human cultural activities that once existed between native Indians and their environment.

Roughly speaking, the piece is made up of four sections which I will describe below. A set of images for each of these sections provided the underlying "tone" for the compositional process. I will speak of these images in the four sections below and how they found their acoustic expression in the piece.

1) During the first three minutes the piece introduces the listener to various specific locations in the forest, e.g. where the raven flies, where the squirrel lives, where the creek flows, where the thrush feeds, where the stellar's jay flies, and so on. It is meant as a sonic journey into these forest places, all of which have, in a subtle way, a different soundscape along with different vegetation and animal life. The "drumbeat" of the slowed-down raven gives this section its

rhythmical pace. The chord that gradually becomes audible in the background, is a foreshadowing of the musical treatment of the songbirds in the last section of the piece.

2) The second section spends time with the dark side of the forest, forest as a mythical place full of powerful natural forces and potential dangers. Acoustically this expresses itself through the use of storm sounds with creaking trees and slowed down animal sounds (mostly squirrel and jay). The chainsaw appears in opposition to these sounds as a modern-day "monster" fighting with the "forest giants". I see it as a mythical confrontation between the ancient forces of the forest and the destructive forces of modern-day economic "progress".

3) The third section spends time at the creek and attempts to lead the listener into the rich microcosm of creekwater timbres and rhythms. Individual water melodies and rhythms are extracted and looped. They fade in and out of the general creek ambience. This section is exploring creek water as an acoustic presence within which the listener can get lost in his or her own acoustic imagination; where it is never clear whether the sounds that one hears are real or an acoustic illusion.

4) The fourth and last section moves the listener into the abstract musical world of the forest. Mostly the slowed-down sounds of song birds are heard in various chordal/rhythmical combinations here, along with the occasional "drumbeat" of the raven, and the tiny "peep" of one of the song birds. This tiny peep appears purposely in the foreground of the grander musical chords in this section as I was fascinated by the enormous difference in proportion between the smallness of this little sound and its (and other bird calls') slowed-down versions. The peep's deep inner beauty, its purity and clarity are revealed when the sound is slowed down. Some of the waterloops also re-appear here from the previous section.

Hildegard Westerkamp (1992)

APPENDIX B. INTERVIEW WITH MATTHEW BURTNER

The following unedited responses were received by email.

CK: Listening to your own work, how aurally tangible is the relationship between the incorporated environment (e.g., the soundscape of the field recording used), and resultant the composition? Does the perception of this relationship match your intention (i.e., does it matter if an audience hears aural similarities between the source material and the piece itself)?

MB: I rarely use recordings from nature in my music. I am more interested in energy fluctuations from nature mapped into music, whether that energy be acoustic or something else. The music is tangibly altered aurally by the ecoacoustic approach. The music is composed in collaboration with nature and those greater structures can be heard clearly. It takes some practice to consciously hear that, but the effects are immediately apparent to any listener subconsciously. I compose “prints” of environmental systems filtered through the human imagination. Some of my pieces are called *Prints* for this reason.

CK: How influential is environmental concern and social change related to your compositional process? To what degree was it a goal for your composition to increase others’ awareness of environmental concern?

MB: My first consciously ecoacoustic works are from 1996. Then I was interested in communicating aspects of environmental systems, particularly harsh conditions of my home in Alaska. I was not looking at the politics of climate change. *Sikuigvik* was not about global warming originally, but it came to be heard that way. The violence of human-nature intervention calls out from that piece.

CK: In your view, how much was relinquished to elements observed in the incorporated environment (i.e., compositional decisions were determined because of environmental observation)?

MB: I often give the articulation of events in time over to the environmental system. I hang a harmonic and melodic structure on that form so that the environment drives form but other elements are composed more traditionally. I let the human system modulate nature and the natural system modulate the human system. In this way my work explores human/nature dialectics.

CK: Is the process of allowing an observed environment to significantly inform musical decisions an attempt to remove the “self” or “ego”?

MB: No, I am most interested in the individual ego in communication with the environment. The point is to open oneself up to new forms of beauty and decenter human desire or expectation. Art can teach us to be less self-centered and appreciate things that are uncomfortable or challenging, or even dangerous. I don't actually think it's possible to remove the self or ego, but in any case I would not want to remove it -- I want to refocus it. I consider musical form in terms of "exposure". The time of exposure shapes the experience across time. When the air is cold, you may want it to warm up, but it won't. Just because an agent in the system desires something, doesn't mean that it will happen. The world doesn't care if you are cold. It just is the way it is and you keep getting colder, beyond the level of comfort. That's how my musical forms work with exposure. At times I want the music to express that feeling of the ego in conflict with the music, in the way the environment may be in conflict with the individual. People who live in the far north of Alaska, the coldest place on the planet, never complain about the cold. Complaining about something suggests that you may be able to change it. I imagine similarly that practiced listeners of Japanese Noise music wouldn't complain about the music being too loud.

CK: Your work makes extensive use of electronics, a medium that many cite as inherently bad for the environment. In creating your music, do you find irony in this idea, or see technology as a means of greater exploration and articulation of environmental observation?

MB: I am inspired by inhospitable places like the far north of Alaska where I grew up. I have written about this a lot (Ecoacoustic and Shamanic technologies in *Organized Sound*). Technology is essential to exist there and better technology makes life better. For example, skis and snowshoes and sun glasses and lighter/warmer clothing are advances in technology that greatly benefit the person in relation to the environment. In sound, technology lets you access the "thing itself" more closely. Rather than working like a painter (impressionism) one can work like a photographer (realism). The technology allows you to zoom in on the details of a moment of timbre, or push outwards to a macro level form. It allows you to remap data accurately rather than arbitrarily. It also allows us new ways of interacting with nature. For example, the wind can become the instrument, rather than merely imitating the wind on an instrument.

CK: Are there composers or artists that have influenced your compositional approach? Specifically, did these individuals push you toward any of the concepts highlighted in this interview (e.g., "found composition," ecological awareness, the degree of compositional authority, etc.)?

MB: I have always been inspired by the sounds of nature more than music, in particular the wind and the ice and snow, the sea and rivers. As a child in Alaska, I liked to play melodies on my saxophone with those sounds. The activity of musically being in nature was a big influence on me. The particular combination of tones and rhythms was less important to me than the activity of singing in nature. Those environmental sounds, and the actions of musical being around them,

are my main musical inspirations. I am very inspired by philosophy, sculpture, science, poetry, architecture, etc. Other media push me towards new musical concepts. I like music and all sorts of it but I am not inspired by it in the sense that when I hear it I want to make something. I listen to music very often, but I process it in a different part of my brain than my music. For example, I can listen to music while I compose music without any problem and it doesn't effect it. But when I read or walk in a building or see a sculpture I am often inspired to make music.

I became a composer actually because I did *not* finding musical models. My music teacher got fed up with me disliking every piece he gave me to learn. He introduced me to every style of music he could: classical, jazz, rock, etc and lots of different pieces. When nothing struck me, he told me to go away and write the music I wanted to play. So I wrote him a piece. And that's how I started composing. Basically that's what I do still. The music I want exists in the world because I initiated its existence. Hal Nonneman (who you met in Alaska at our EcoSono concert) was a huge influence on me in this way.

When I was a senior in college I heard Xenakis computer music for the first time. I went to Paris to work in Xenakis' lab after I graduated. I also heard Truax computer music as a senior and I sought him out in Canada (by taking his workshop at ICMC and then going to work in the World Soundscape Project Archives at Simon Fraser for a summer). Those two artists showed me a way forward with composition and my interest in environmentalism by going into technology. Computational technology was a key musical influence. As I said before, I like music in which the human form is set into dialog with some external/environmental force. Is the human stuff noise or is the environmental stuff noise? They are two noises in dialog. I am distrustful of impressionistic approaches. I rather trust music that uses technology because I believe it will have made use of the "reality" of nature -- like a photograph over a painting. For me it feels more honest to use technology in combination with human performers. I am also distrustful of modern reductionism, that claims to remove the human subjective and the emotional from music.

CK: If at all, how have any of the following fields informed your work: acoustic ecology, soundscape composition, ecoacoustics, sonification, phonography?

MB: I think my last answer gets at this.

CK: Who would you consider your contemporaries (i.e., others working in a similar manner or with like-minded concepts that embrace the topics we have discussed)?

MB: I admire artists who make unusual choices, people who make a surprising artwork without concern for like-mindedness or style or genre. Someone gets an idea and just does it, honestly and in a focused way.

CK: If you did not utilize field recordings, environmental observation, or similar elements, do you feel your music would sound substantially different? How might you approach the compositional process?

MB: Before I used those things my music was more intricately and squarely formed. It's like I went from stacking boxes to working with snowdrifts. Technology enabled process, transformation, noise and politics in my music in surprising ways.

CK: *Sikuigvik* and select works of yours do not allow the listener to hear the original observed environment. In some cases, electronics are not incorporated in the performance of the work. How does the use of electronics fit in your pre-compositional process and is it a crucial item, considering the employed musical material?

MB: I use the technology to analyze nature. Through it I observe the systems of energy fluctuating in the world. Then I map those systems into music, sometimes simply by hanging freely composed musical events onto a structure derived from observation.

CK: How do electronics in the pre-compositional process enhance the musical goals of this and other works?

MB: I have invented a number of approaches that set the human imagination in dialog with nature using technology. I use transduction, spectral analysis, and real time interaction to do that. I mentioned this above, but I think electronics allows us to play with a version of the thing itself.

CK: At times you have undergone extensive field recording, but the sounds are not heard in a piece or, you may not even listen to the recordings later. Could you expand on your idea of experiencing a place and how this informs a resultant work?

MB: I talk about this in my paper "Adventures in Interactive Ecoacoustics in the World". See the section on Chasing Raven. You only know a place by interacting with the energy fluctuations there. The deeper one's knowledge (of the source), the deeper the music will be. I wrote music of Alaska because I know Alaska so very, very well. My music written in collaboration with Namibia, the Indian Ocean, Guatemala, etc, is not as deeply informed by the place. It's more like tourism. When people compose "Alaska" music I often hear it as tourist music. There's nothing wrong with that, it just reminds me that experience with the place (or source) is essential. I have a native knowledge of Alaska the way some people have a native understanding of urban contexts. It's this deeper knowledge that the artist accesses.

CK: *Sikuigvik*, formally and in other ways, offers something we cannot hear (e.g., events that span a significant amount of time). Could you expand on this idea (i.e., creating a medium for something that can otherwise not be heard)?

MB: *Sikugvik* invents a syntax of thawing. At first the ice thaws, but then I depart from the true natural system and I flex the musical syntax by refreezing and thawing at will. I play with that system (human/nature dialectics) The climax is a refreezing of the rhythmic/harmonic system. The cadenzas define sections of the piece where I change the approach. This is typical of ecoacoustic music. It first starts with data sonification (or in soundscape composition it will start with the real recorded sound) and then it departs into imaginary/fantasy space. In my case this means composing with the new system derived from the environmental process.

CK: Are there additional thoughts you wish to add, related to *Sikuigvik* and the addressed topics in these questions?

MB: I suggest you compare *Sikuigvik* with *Iceprints (2010)* for 1-3 pianos and sub-ice ecoacoustics, because in that piece I encoded the harmonic system of *Sikugvik* as a filter and use sub-ice recordings of ice melting to drive the filter. In *Iceprints*, the melting ice plays the music of “The time of Ice Melting”. And *Iceprints* was composed with climate change data so it takes on the deeper time scale of “the time of ice melting,” in this case a forty year cycle. *Iceprints* may offer new insights to *Sikuigvik*.

APPENDIX C. INTERVIEW WITH JEZ RILEY FRENCH

The following unedited responses were received by email.

CK: Listening to your own work, how aurally tangible is the relationship between the incorporated environment (e.g., the soundscape of the field recording used), and resultant the composition? Does the perception of this relationship match your intention (i.e., does it matter if an audience hears aural similarities between the source material and the piece itself)?

JrF: whilst I understand this form of establishing the intent or outcome of any artists work I personally prefer not to spend much time explaining this as its really very dependent on each specific work. Also, a work isn't fixed as such - my own response to it changes, or rather it can shift slightly.

CK: How influential is environmental concern and social change related to your compositional process? To what degree was it a goal for your composition to increase others' awareness of environmental concern?

JrF: In a limited way perhaps: I'm not a 'nature' recordist in the conventional definition of that term and so my work didn't begin with environmental concerns. I am, in this context, more concerned with the way we (our species) establish norms and expectations and how they restrict or distort realities. I think, for example, that using sound to allow people to 'experience the serenity of nature' (for example) is simply a further example of humans using nature for its own purposes and with its own ideas imposed upon it. I would also add though that if anyone listening to my work, or the work of other artists using located sound, then goes on to re-listen or re-think their surroundings then that would be a positive outcome.

CK: In your view, how much was relinquished to elements observed in the incorporated environment (i.e., compositional decisions were determined because of environmental observation)?

JrF: This might not fully answer your question but I press 'record' when it feels right. Any aspect of that decision that is compositional is about personal intuition, which is influenced by all kinds of things, from the location to the light to my own mood at the time.

CK: Is the process of allowing an observed environment to significantly inform musical decisions an attempt to remove the "self" or "ego"?

JrF: I think this concept of the removal of self or ego is rather complex when it comes to field recording and sometimes actually represents another layer of self / ego. Any aspects of ego that

should be worked on or removed are really about much more than ones work. ‘Self’ is present always.

CK: Your work makes extensive use of electronics, a medium that many cite as inherently bad for the environment. In creating your music, do you find irony in this idea, or see technology as a means of greater exploration and articulation of environmental observation?

JrF: I really don’t see my work as using electronics extensively - or rather I don’t see that I use any more electronic devices or elements than any artist does, or indeed any person does in their daily life. In terms of my sound work than actually the majority of it is done without any devices except my ears - its the listening that is the important thing. As for the question of if they are bad for the environment I really think that is a much more complex discussion. Is it bad that we have developed these technologies or is it simply the way we, as a species, have evolved & is there something in that question that we have so far missed ? Is there a value to restricting our evolution in order to avoid negative impacts - yes, of course, but first we need to get passed this idea that we can or should control what we want ‘nature’ to be. As someone with a fascination for sound the one thing that I do find problematic is how we have invented recording and playback technologies and then, in terms of the mainstream, use them to actually damage or reduce our ability to listen; heavy compression in film for example or using headphones that are not only bad for the sound experience but damage / restrict our hearing range.

CK: Are there composers or artists that have influenced your compositional approach? Specifically, did these individuals push you toward any of the concepts highlighted in this interview (e.g., “found composition,” ecological awareness, the degree of compositional authority, etc.)?

JrF: Not really - I more or less reject this idea of influence simply because its a rather narrow one. As artists we are influenced by all kinds of things every day in ways that have more of an impact than the work of other artists we perhaps heard years ago & yet its a question that always focuses only on one aspect of influence. If I listed the artists and musicians that have been important to me then they would not be, probably, those working in a similar field to myself at all. On the other side of this question though is that I am aware of some of the negative aspects of sound / field recording culture: the misogyny, the increasingly problematic area of aspects of sincerity and authorship etc. If and how that feeds in to my determination to remain connected to my personal enjoyment of listening, rather than being part of any ‘scene’ is another question perhaps.

CK: If at all, how have any of the following fields informed your work: acoustic ecology, soundscape composition, ecoacoustics, sonification, phonography?

JrF: I don't really work this way. I think such questions almost invite an interpretation of the creative process which is less personal and sidetracks the more important aspects. All the knowledge I find along the way matters, from researching mountain villages in Northern Italy to how comfortable my shoes are - these are all influential. I don't see my role as simply another voice repeating the same things. Some artists can create a space for themselves from within established modes but others might interact with all manner of forms and systems but do (& must) be free of them in other ways.

CK: Who would you consider your contemporaries (i.e., others working in a similar manner or with like-minded concepts that embrace the topics we have discussed)?

JrF: I don't really want to answer this as such. I like various other artists work and I also know lots of artists whose work deserves its place in the history of sound art or field recording for example, but i'm not sure this question is the right way to frame them, if you see what I mean. I could explain it like this: if I were given a building with multiple rooms & asked to curate a show of sound art I would have no trouble knowing who i'd like to ask to contribute. However I wouldn't then say 'this is a show of the artists I consider my contemporaries' - does that explain ? One things I will say however is that at a rough guess I would estimate that around 90-95% of the artists currently working with sound that I think of as important or as creating really interesting and powerful work are female. There are some reasons for this, I believe, such as that, in general, males tend to have a dominant focus on the technology, ideas of technical precision and have such a restricted view of sound and perhaps even their own gender. There is a sort of creative energy that is often hardly there & when it is it tends to be predictable. There are no doubt much better ways to discuss this but put simply its possible to predict so much male generated work. There's a reason prog-rock was almost exclusively a male preserve (said with a smile). As for myself, I see the investigation and exploration of my own connection to 'male' as an increasingly important aspect of my work and my life. I have to know more, to question and to break through my own ideas of what that means and how it influences everything. I need a better vocabulary, we (males) need a better vocabulary - we need one that comes from years / decades / centuries of asking important questions of ourselves.

CK: If you did not utilize field recordings, environmental observation, or similar elements, do you feel your music would sound substantially different? How might you approach the compositional process?

JrF: its hard to say, but my work with conventional musical instruments has, for a very long time, been explorative and always about texture, duration and often quietude. It has also involved location - as both performance space and equal element sonically.

CK: *resonances di topolo*, and other works, seem to employ many simultaneous field recordings to create the overall texture. How do you determine which sounds are present and when they begin or end? If purely intuition, how much experimentation occurs prior to concrete decisions being made?

JrF: If I understand the question correctly, this is incorrect. Nearly all of my pieces involving field recording only feature one recording at a time. They are not playing simultaneously. The compositional choices of duration and where in the piece a sound should appear is intuitive and, as with any artistic process, there are elements of experimenting and, importantly, allowing choices to sit for awhile before being returned to and sometimes changed.

CK: How do you determine when musical events will occur? Are they simply a byproduct of determining what recordings are utilized? If not, how do you decide formal events?

JrF: I think this is asking 'how are you the artist you are' & as such there are aspects to that which I cannot put into words, or perhaps shouldn't attempt to.

CK: As with *resonances di topolo*, much of your work avoids tangible alteration of field recordings. What initially inspired this practice of retaining the recordings in their original form?

JrF: quite simply I am fascinated by the sounds as I can find them. I'm also not someone who has a strong intuitive connection to digital processing in a conventional sense, so the process of altering the recordings isn't something that I am that interested in - or haven't been.

CK: *resonances di topolo* offers the idea of including one's locale. Do you have a general soundscape you feel would coincide with the work? Are you truly open to any sounds that may be heard in the quietest part of one's day (as instructed)?

JrF: no - the entire point is that it is every listeners locale which is added to the experience of listening to the piece. Some might 'work' (for the listener) & some might not - both outcomes are equally important.

APPENDIX D. HSRB INFORMED CONSENT LETTER



INFORMED CONSENT

Introduction: I am Cory Kasprzyk, a doctoral student at Bowling Green State University, and my research advisor is Dr. Marilyn Shrude. My research topic is found composition: ecological awareness and its impact on compositional authority in music employing electronics.

Purpose: The purpose of the study is to examine how environmental awareness impacts the degree to which a composer, utilizing electronics, relinquishes musical decisions. Analysis of works by Jez Riley French, Hildegard Westerkamp, Matthew Burtner, and Rand Steiger will be used to highlight the study's focus. By participating in the study, you will benefit from a discussion, which explores the various nuances, and the extent to which environmental awareness permeates the end result of these and similar works. The scholarly community, listeners, and related musicians will also benefit from the accumulation and focus of ideas. There will be no monetary award for participating.

Procedure: A set of interview questions will be sent to you by email. While response time will vary with each participant, your responses may take approximately one to two hours to complete. A response time of one month is requested. If more time is needed however, you may have up to three months to complete the interview. To yield clarification in responses, follow up questions may be provided.

Voluntary nature: Your participation is completely voluntary. You are free to withdraw at any time. You may decide to skip questions or discontinue participation at any time without penalty. Deciding to participate or not will not affect your relationship with Bowling Green State University.

Confidentiality: This study is not confidential or anonymous, and does not include sensitive information about participants. Participant names and interview responses will be published. All participants must be at least 18 years or older to participate in the study. Prior to publication, all electronic data will be stored on a password-protected computer. During this time, only Cory Kasprzyk and Dr. Marilyn Shrude will have access to the data.

Risks: The risk of participation is no greater than that experienced in daily life.

Contact information: If you have any questions about the study, please contact Cory Kasprzyk at (443) 722-1158 or crkasprzyk@gmail.com. You may also contact Dr. Marilyn Shrude, Faculty Advisor at (419) 372-2055 or mshrude@bgsu.edu. For questions about participant rights please contact the office of Human Subjects Review Board at BGSU at (419) 372-7716 or email: hsrb@bgsu.edu. You have been informed of the purposes, procedures, risks, and benefits of this study. You have had the opportunity to have all of your questions answered and have been informed that your participation is completely voluntary. By responding to interview questions, you indicate your consent to participate in the study.

APPENDIX E. PERMISSIONS CORRESPONDENCE WITH MATTHEW BURTNER

11/12/2017

Gmail - quick permissions question



cory ryan <coryryancomposer@gmail.com>

quick permissions question

2 messages

cory ryan <coryryancomposer@gmail.com>
To: Matthew Burtner <Matthew@matthewburtner.com>

Fri, Sep 22, 2017 at 8:45 PM

Hi, Matthew,

Hope your semester is off to a great start. I'll be defending my dissertation at the end of October!

Do you have any objection to me using pictures found on your website within my dissertation? Specifically, I hope to use *score excerpt one* at the top of [this page](#) on your site.

Thanks for letting me know either way!

Best,

--

cory ryan
<http://coryryancomposer.com>

Matthew Burtner <matthew@matthewburtner.com>
To: cory ryan <coryryancomposer@gmail.com>

Fri, Sep 22, 2017 at 9:08 PM

Yes, that is fine.
Congrats!
Matthew<http://www.matthewburtner.com>
(sent from my phone)

[Quoted text hidden]